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Roads, Drives and Paths and their Construction.

The construction of roads is always a problem, for the cost is comparatively large, and the least expensive materials and methods are not always, if ever, the most economical. Each year's experience is apt to convince one that former methods can be improved upon. In park roads a question of great importance is the color of the surfacing material. The drives on the interior of the parks, particularly, should be as inconspicuous as possible and neutral tints are therefore to be desired in the surfacing materials. This, of course, applies to boulevard drives also, but is not so imperative as in park driveways. The character of the surface upon which the road material is placed, of course, determines the possibility of constructing a good road of any material. Sand properly and evenly compacted makes a satisfactory base, but no little care is required to put even sand in good order for receiving the material. It frequently happens that just before entering upon the construction of a road the ground is opened for various purposes by contractors who are not interested in the foundation of the road, and therefore simply fill in the trenches without any care as to puddling or ramming. These trenches should be partially re-opened for the purpose of thoroughly puddling and back-filling. Specifications for constructing roads generally require that the graded earth shall be rolled until no settlement occurs under a ten or fifteen ton steam roller. If this is faithfully carried out, with all trenches properly puddled and all sand that has been removed within two years, either in the trenches or on the surface, thoroughly wet while being rolled, a foundation practically of an unyielding character may be obtained in sand.

Puddling seems to have several definitions. Some think it has been successfully done if a trench, after having been, perhaps, two-thirds filled with earth, is flooded with water and then the remaining filling placed. This, of course, is better than no attempt in that direction, but well-rammed back-filling is better than that; indeed, with material which water will not break down ramming is the proper treatment, the material rammed in layers not exceeding six inches. Proper flooding of trenches consists in throwing all the back-filling into water; if otherwise done, it is not successful. It is not always practicable to do this on account of the necessity of having sewer trenches partially filled before the cement sets. In such cases the first 18 inches or two feet of filling should be carefully rammed. But, how seldom is this done! The matter of draining the foundation should not be overlooked. If the earth for several feet in depth, and for some distance on either side, is sand, and the road not ma-

terially lower than the surrounding surface, no undergrading will be necessary; but, with a foundation of clay or vegetable mould, it is desirable to provide some means to carry off the water which would otherwise accumulate in the foundation, and by being frozen heave the road material, break the bond, and form a spongy place in the road, greatly to its injury. When the sewers have been constructed and catch-basins built at the side of the drive at intervals of about 200 feet, the making of small trenches in the earth leading to openings in the catch-basins, and filling them with coarse stone will overcome the difficulty, unless the ground is very soggy, in which case lower drainage by tile will be required. If the methods above enumerated are carried out, one may safely build the road upon a foundation so prepared with the assurance that little, if any, settlement will occur.

The form of a road should be carefully considered, in connection with the material to be used. A macadam or gravel surface should have an inclination towards the gutter sufficient to carry off the water quickly, but not so rapidly as to make gullies near the gutter. For drives that are not subjected to heavy traffic and are kept in good repair, a crown of about two per cent. of the width of the road is about right, although for narrow drives this should be somewhat greater, and for drives over fifty feet somewhat less. Drives used for all traffic, and not having the best of care, should have two and one-half per cent. crown at least. For hard surfaced roads, such as wooden blocks, brick and asphalt, the crown should decrease from that above stated in the order named, asphalt having, if properly laid, about one and one-quarter per cent. of the width. The crown named is that which I think is desirable at the catch-basins; at the summit, when the grade of the center of the drive is level, it would have to be less, except the center of the drive rises with the gutter, which is not desirable. Catch-basins should be placed at intervals not exceeding 200 feet. The catch-basins should be placed outside the driveways in the lawn or walk, as the case may be, thus avoiding the inconvenience and danger of a cover where horses travel. The inlet to the basin will have to be through the side of an iron cover or through the curbing and wall of the basin. There are many ways of doing this and many patterns of covers. It is of little consequence just how it may be accomplished; the main thing is to have it done in a durable manner. The curbing should stand about six inches above the gutter at the catch-basins, and three inches at the summits of the gutter, to make the best appearance. On business streets, where the walk extends to the curb line, three inches may be added to these heights. The upper corner next to the driveway should be cut to a circle, with a radius of one-third the thickness of the curb; an axed or bush-hammered surface is the most pleasing. The depth of stone curbing should be not less than 24 inches in sandy earth; in clay, not less than 30 inches; that is, if not rising above the gutter more than the figures above given. Twenty-four-inch curbing may seem quite shallow, but I have had excellent success with it in sand, when carefully set on good stone blocking not less than six inches thick. On roads where heavy wagons are likely to back up against it, the most eco-

nomical and satisfactory material to use for curbing is granite, although the original cost of the stone is fully double that of limestone in this locality. I do not think any other kind of stone should be used on city streets. In suburban streets and boulevards, where there is little likelihood of its being injured by wagons, concrete is very satisfactory. If properly made it is durable and is satisfactory in appearance, though the surface should not be troweled. If proper care is taken in the foundation, it is not as likely to settle irregularly as natural stone curbing. On sand, a bed of well-rammed cinders six inches in thickness, and on clay twelve inches in thickness, I have found to make a good bottom. The concrete gutter, either in connection with curbing or not, is unsatisfactory. If on a street where there is heavy traffic it will be broken down on the edge and soon look very badly. If placed where there is not much traffic it may endure, but is unsatisfactory because the least little dirt shows so plainly that it must be cleaned every day or it looks as if badly neglected; particularly does this objection apply to boulevards. A gutter is desirable on streets where the grade is so great that road material will be washed out or where horses are likely to stand at the curbing and paw holes in the road. Other roads look better without gutters. Where gutters are necessary, bricks and granite blocks are the proper materials, laid with as much, if not more, care than when used as a pavement.

PAVEMENTS.

Of the many kinds of road materials used each has qualities to recommend it for certain places and conditions. The stone block, of which there are many kinds, is probably the most durable pavement, and in streets where there is a great deal of very heavy traffic about freight houses and other places where noise is not an insuperable objection, this is undoubtedly the best pavement to use. The best block pavement is obtained by laying the block on a cushion of sand about 2 1-2 inches thick, resting on a concrete base; the only reason for the sand being so thick is to take up unevenness in depth of blocks. The blocks should not be too wide; the smoother surface can be obtained with blocks from three to four inches in width and nine to twelve inches in length. For heavy traffic they should not be less than six inches in depth. The joints should be filled with screened lake gravel of a size to be determined by the thickness of the joints between the blocks, which depends upon the specifications under which the blocks are cut. The joints, however, should not be more than 5-8 of an inch at any point. The gravel should be well prodded in and the joints filled with paving cement. The proper ramming of the blocks is of great importance. There are many blocks called granite which are not granite, but frequently the stone is just as good. There are some hard sand stones which make an excellent pavement, not being as slippery as the harder stones; but, of course, they wear more quickly. As a general proposition, the harder the stone the better. Probably there is a greater variety of stone used for paving in Chicago than in any other city; five, or perhaps six, kinds of stone used are excellent, one nearly as hard as the other, though strictly speaking,

three of the best kinds used are not granite though accepted under specifications calling for granite. The great objection to stone block pavement is its being noisy and very disagreeable to ride over, and, next to asphalt, the most slippery of pavements. Its life on a suitable foundation, where openings are not frequently made in the street, is somewhat conjectural, but it may be counted on for twenty-five years under the ordinary business traffic, with repairs not exceeding ten per cent. of the original cost for that period.

ASPHALT PAVEMENT.

Asphalt pavement needs no description; everyone knows that it is a sheet of certain kind of bituminous matter spread over a concrete base. Properly made, its durability is next to stone blocks, and if the blocks are not of the best stone it will outlast them. It is easy to keep clean; it costs much less than stone blocks; and is not very disagreeably noisy. For ordinary city business streets, and residence streets that are not to be well cared for and are not used to a considerable extent as a pleasure road, asphalt is probably the most economical and satisfactory pavement. From a sanitary point of view, and for the ease with which it may be kept clean, it is undoubtedly superior to any other kind of road surfacing. Its drawbacks are its slipperiness, and, on residence streets, the clicking sound caused by fast moving horses. It will probably endure under the traffic of a business street when it is not excessive for fifteen years, at least, before renewal is necessary. The cost of such repairs as may be required during the fifteen years, aside from such openings as may have to be made in the street, will not exceed eight per cent. of the original cost. It can be laid for about forty per cent. of the cost of stone block pavement.

WOODEN BLOCK PAVEMENT.

The wooden block pavement has many forms of construction and many kinds of wood are used. The round cedar block has nothing to recommend it except its small cost. The blocks so soon become worn on the edge that the road, except as to hardness, is much like cobble stone, and after getting in this condition the blocks are very quickly pounded to pieces where there is much traffic, either of light or heavy vehicles. The old Nicholson pavement, in which pine or other wood blocks of rectangular form were used with one inch spaces between the courses filled with lake gravel and paving cement, was better than the cedar block only the fact that only two edges of the blocks would quickly wear down and expose the blocks to the pounding process, which quickly demolished them. Both the cedar blocks and the Nicholson pavement have heretofore usually been laid on plank laid in sand in the natural earth foundation, supposed to have been well rolled. The result was, of course, what could only be looked for, rapid settlement into an uneven surface, and the blocks quickly worn out if there was any traffic to speak of on the street. A wooden pavement, perhaps more than any other, requires a firm foundation, and, except under uncommon conditions, the blocks should be laid on

a one-inch cushion of sand on a concrete base. The blocks should be five inches in depth, three inches in width, and about twelve inches long, laid closely together with expansion joints here and there to take up the swelling of the wood; just what may be required in this direction must be determined in each case, the condition of the wood and its character will suggest the precautions to be taken. Pine blocks of the above named dimensions, laid fairly dry, with joints rather loose, but still the blocks set against one another, with the joints afterwards swept full of fine sand, and paving cement poured over all, did not swell sufficiently to heave the pavement at all. On the other hand, oak blocks laid in the same manner have expanded seven inches in twenty feet. Expansion should, therefore, be provided for at short intervals in the pavement or the blocks will creep more or less, and in doing so lose their even surface, causing quick wear. The question of what kind of wood is best is one difficult to answer. In the first place any wood should be treated by some of the best methods for preserving it. If properly done this will dispose of the matter of decay in making the selection. Oak will probably wear longer than any other wood obtainable in this locality at a reasonable cost, but it becomes much more slippery than pine or cedar. The pavement may be greatly protected from wear by covering it once a year with a good dressing of paving cement and rather coarse, sharp sand at a cost of not exceeding ten cents per square yard. Where the pavement is not greatly used by heavy wagons and when the traffic is not excessive, this one dressing a year will double the life of the pavement, and at the same time furnish a most desirable surface to drive over. If kept surfaced in this way the objection to oak on account of its being slippery would disappear. Good pine, all things considered, is probably the best wood except where used largely by heavy wagons, when oak should be used. The life of wood block pavement is, as the foregoing will indicate, rather indefinite. Without treatment for preserving the wood and not kept dressed with tar and sand, decay will destroy it in from four to six years, according to the wood used. Much heavy traffic will wear out pine in three years or less; with a large light traffic it might last four years before having to be renewed. Oak would probably last four and five years. As to the preserving of the blocks: I have some specimens of blocks treated for preserving them against decay which are vouched for as having been in a pavement in a well used street for over twenty years, and the blocks are in good condition today. The wooden block pavement is the most quiet of all pavements, it can be very quickly relaid when necessary, and, next to a macadam or dirt road, is, when in good condition, the pleasantest to drive over; but, unless it is laid with the greatest care and kept in good order as indicated above, it has only its noiselessness to recommend it. The cost of pine block pavement would be about fifty per cent. of granite blocks. The cost of keeping it in good repair will be about fifteen per cent. of the cost per annum. A concrete base, such as has heretofore been referred to, should be at least six inches thick, and, like all concrete, cannot be too good, though in many places Portland cement will not be a necessity.

MACADAM.

The macadam road is the most pleasant to ride upon of any with the exception of a dirt road in its best condition. The thickness of the material used depends upon the use to which the road is to be put and the character of the foundation. The necessity for careful preparation of the foundation for any road has heretofore been noted, and in considering the different kinds of roads it is presupposed that the foundation is properly prepared. On a sand foundation, macadam road material should be for the heaviest traffic fourteen inches in depth; for ordinary heavy traffic, twelve inches; for light traffic, such as boulevards and suburban residence streets, nine inches; for park driveways, eight inches; on clay or loamy foundations the addition of about two inches to these depths is desirable. A macadam road should not be considered for heavy traffic except where the cost of constructing a better road cannot be met. In some places it is impossible to avoid it as a temporary expedient; it can only be justified under some such conditions. The under ten, nine, six and five inches respectively of the thicknesses named, may be made of the cheapest stone obtainable, which will not crush or grind up under a fifteen-ton roller, or disintegrate through the action of the elements. It should be crushed into pieces closely approximating two and one-half inches in their greatest dimensions, and thoroughly rolled in layers not exceeding six inches in thickness. With proper foundation this will make a road as satisfactory as the more expensive method of using in the first course large stones, placed by hand base down, known as the Telford road. There may be some cases when such a method would produce better results, but they do not frequently occur.

For the surfacing of the road—that is, the upper three or four inches, as the case may be, different kinds of stone and gravel are used. The most durable and cleanest is crushed granite and trap rock, but either is much more expensive both in first cost and cost of maintenance, than good hard limestone, but under certain conditions the extra cost is justified by the much better results. On a boulevard drive used extensively a road surfaced with granite or trap rock will not wear as rapidly as it would if limestone or gravel was used, which results in not having to resurface it frequently, in not having to clean it so often, and in its not being as muddy in wet weather. These qualities are very desirable and fully warrant the extra expense on streets where there is a very heavy drive. In outer boulevards, where the driving is not so constant in all kinds of weather, a limestone surface is probably the best, cost being considered. In parks white limestone is objectionable on account of its color, therefore a good bank of gravel is desirable. The crushed bank gravel is usually limestone discolored and is nearly as clean and durable as the stone. In some parts of the country there is a grayish blue limestone which makes a good surfacing for park roads, the color not being objectionable. Trap rock and the gray granites would be excellent for park roads, but if good gravel can be obtained it is so much cheaper and so nearly as durable for the purpose that the use of granite is hardly justified. The three or four inches of surface material should be

crushed to as nearly a uniform size as possible. For the traffic roads the pieces should be one and three-quarter to two inches in largest dimensions; for the other roads, one and one-quarter inches. It is a mistake to use this material too coarse on roads to be used by light vehicles. With stone larger than one and one-quarter inches the road will surely become rough on account of the pieces being kicked out here and there by fast moving horses leaving slight depressions, which are not only unpleasant to ride over, but help to wear out the road, keeping it soft by catching and holding the water thrown on the drive by sprinkling wagons and rains. This surfacing material should be rolled without stint and only so much fine packing material added as may be absolutely necessary. All the fine stuff added is sure to come back to the disadvantage of the road in the shape of mud. The best material for packing granite is powdered limestone and only about one-half an inch of this should be used. It should be borne in mind that a roller never packs a new road; it simply presses the material together so that it will keep in place until the wheels of the vehicles passing over complete the work; therefore, it is a mistake to keep putting in fine packing material, hoping to complete the work with a roller; mud only is being added. With trap rock and limestone fine stone of the same kind is used for packing.

Rolling is the most essential work in the construction of a road and should not be slighted; in all cases it should continue on the lower courses until no depression is made, and on the upper or finishing course until it "mortars up," or becomes covered with mud. A liberal use of water helps the matter along very much. The macadam road, even when surfaced with the hardest stone, where used greatly in the continued wet weather of open winters and in the spring and fall, will at times become muddy and disagreeable, but this condition will likely only exist for a small part of the year, and at a time in the year when there is little, if any, driving for pleasure. On the other hand, it is so much more desirable than any other road during the driving season that people generally, cheerfully put up with mud as an unavoidable evil, feeling that they are more than recompensed for the discomfort when the road is in good condition. This justifies the use of macadam roads on all boulevards, even those where the driving is very heavy or on the residence street where care will be given to the road. If properly cared for a macadam road is the most satisfactory of all roads for all places where people drive for pleasure to any extent, except where there is considerable traffic with heavy wagons.

Limestone macadam roads properly built will cost, in Chicago, for the eight-inch road, about twenty per cent.; nine-inch, twenty-two per cent.; twelve-inch, twenty-five per cent.; fourteen-inch, twenty-eight per cent. of the cost of granite blocks; the granite or trap rock surfacing will cost about twice what the limestone does. Gravel is perhaps fifteen per cent. more expensive than limestone. The cost of a nine-inch limestone road, as the work is done in the South Parks, Chicago, is about seventy-five cents per square yard at present prices.

The duration in good condition of granite surfacing where the pleasure driving is heaviest, is three years; the cost of renewal at present prices with the best material is not less than forty cents, making the annual cost of renewal of surface about thirteen cents. The annual cost of maintaining such a drive will not be much less than fifteen cents per square yard, there being more or less patching required each year. A stone or gravel surface under the same conditions would have to be renewed in two years; the cost would be only about half as much, but its condition would be unsatisfactory most of the time.

An equestrian road may deserve mention: tan bark, sand, gravel and clay, have been used for this purpose, placed upon firm stone or gravel bases and on spongy earth. With us most satisfactory results have been obtained by properly shaping and draining ordinary black earth (not clayey) and covering it with a thin dressing of the cleanings from macadam or gravel roads, just sufficient to make a surface into which a horse's feet will not sink. This makes a springy road, very enjoyable and not hard on the horses. In very wet weather it becomes soft, but properly drained is in a few hours in good order again.

The maintenance of roads is only a very simple matter, but like all other tasks the way to do it is to do it. But just there is where most corporations or commissioners fail. It is difficult for many to understand that the work of maintenance should commence on a road the very day it is completed, the result being that more frequently than not, the road is left until its condition demands repair; then will it be continually unsatisfactory, no matter how much care is given it until it is resurfaced. The first necessity in the maintenance of a road is proper sprinkling. It should always be damp enough to prevent dust, but never wet enough for mud. It is essential for the preservation of a road as it is for the comfort of those who use it. I know of no more difficult thing to do in the maintenance of parks than to obtain satisfactory work in sprinkling the drives. It is so much a matter of judgment on the part of the drivers of sprinkling wagons that they should be not only much more intelligent than the ordinary laborer, but should also have considerable experience, and above all be men who are willing to do whatever work is necessary to bring about the desired result. Without these qualifications in the men it is absolutely impossible to do the work at all well; and in addition to this the sprinkling wagons must be properly made and the pans or whatever device is used for throwing the water adjusted so that the driver can regulate the discharge just as he wishes for any condition. To these requisites must be added eternal vigilance on the part of the person responsible for the manner in which the work is done.

Next in importance is keeping the roads clean. There are many ways of accomplishing this. The regular use of the sweeper is probably the best, though it really matters little so it is accomplished in such a way as not to disturb the integrity of the material. The patching of the road as it wears into small depressions can be quite effectively done with limestone or gravel, and with some trap rocks and

soft granite, but with hard stone it is very difficult to accomplish much that is satisfactory in that way. But patching when most successfully done cannot preserve a road; it only keeps the surface smooth as it wears out. Sooner or later resurfacing has to be done; usually it is demanded when the center of the road has worn down about three inches; it should then be done at any rate. It is probably needless to say that the resurfacing is simply loosening up the surface, adding the necessary new material to bring to grade, and rolling until thoroughly compact. Many drives that are little used are likely to be found with the bond broken in the spring when the frost comes out of the ground. These should be gone over with a steam roller with perhaps a little packing material added. It is surprising how cheaply this can be done and how greatly the drives will be improved by it. Most outlying park and boulevard roads will be so greatly improved by this rolling in the spring that its cost is more than repaid in the resulting excellence of the roads during the remainder of the summer. Again I say the maintenance of park roads is a simple matter. Its success or failure depends simply on doing or not doing it. But it costs something.

The park road to be at all satisfactory must have three qualifications: It must be in good repair; it must be clean; it must be properly sprinkled. These conditions are to be attained only by constant attention and efficient management, with the expenditure of money. In many things in the world the expression, "That is good enough," may indicate a satisfactory condition; but in park roads and park work generally, if that is to limit the efforts the result will be mediocrity. A road is clean or dirty. It is well sprinkled or it is muddy or dusty. The lawns are green or they are dried out. The trees are pruned and thrifty or they are full of dead wood and dying. Things either are or they are not. A park is the municipal luxury of a community. A luxury to continue as such in the estimation of those who enjoy it must continue to be to them perfection of its kind. A luxury is expensive, usually an extravagance. Perhaps parks are extravagances; but as long as the people consider them luxuries they will as freely expend their money for the maintenance of the parks as they do for other luxuries, if they feel that a dollar expended buys a dollar's worth of material or labor. But just the moment that there is a falling off in efficient care and exquisite beauty just then will the people commence to question the wisdom of the park tax and shortly the revenue will be reduced to a point where satisfactory maintenance cannot be had. Excellent maintenance should be the first consideration of all park commissioners. Unless the majority of people of a community think their parks are just a little better than any parks in the world, that park system is on slippery ground. To create that impression it only needs proper maintenance, and there is no place where the want of it is more quickly noticeable than on the roads. Do not let the luxuriant vegetation with which nature adorns either side of it be marred with the ugly, unkept road.

Park roads are regrettable necessities. Do not multiply the necessity for them by introducing extraneous attractions into the

park. Simplicity is always beautiful, and above all things the simplicity of nature. Let your park be a piece of country, your roads only ways to reach its beauties, mostly roads through thick woods, closely planted upon both sides hidden. There are open roads enough in the approaching boulevards. There let the peacocks of fashion who drive only to be seen disport themselves. Make the roads in the parks the quiet peaceful ways of the lovers of nature, and those who travel them will find themselves approaching near and nearer to the truest pleasure of life—the full appreciation and enjoyment of the wonderful beauty which nature has so lavishly strewn all about us.

Chicago, Ill.

J. F. FOSTER,
Superintendent South Park System.

Park roadmaking is a big subject. It would take a book of several hundred pages to do it justice, so I shall have to content myself with a few observations. Park drives and walks should be graceful and as little conspicuous as possible, and at the same time well constructed. Thorough underdrainage is most essential wherever the sub-soil is such as to require it. For comfort, as well as for appearance, park roads should be made with less crown than is customary. To do so, however, involves very assiduous and careful maintenance to promptly repair all tendency to form ruts and hollows. A strongly crowned macadam road, particularly if it is a fairly wide one, will almost inevitably have a vast number of little gullies washed crosswise in the steeper portion of the crown near the gutters. This, and the disagreeable tipping up sideways produced by a strong crown, makes it very uncomfortable to drive near the side of the road, with the result that everyone drives along the centre except when forced out to pass another vehicle, thus causing a concentrated wear on the portion of the road where the least wear most quickly produces a depression; a depression once formed wears more quickly than any other portion of the road, as it is kept softer by the accumulation in it of water after every rain storm. Anyone contemplating building macadam drives with stone which has not been thoroughly tested before in roads may derive some assistance in forming a judgment as between different kinds of rocks proposed to be crushed by communicating with the Road Bureau of the Department of Agriculture at Washington, D. C. Tests and analyses and reports on specimens submitted will be furnished free. One piece of advice this Bureau furnishes may be new to many park superintendents. It advises that the hardest rock (such as trap) should not be used for surfacing drives where there is comparatively little traffic. The rock used should be sufficiently soft to supply by the wear of passing vehicles the amount of grit and dust needed to maintain the binding quality. Unless the ingredient of macadam is continually supplied by this method or by applications to the surface expressly for the purpose, rain and wind will wash the fine grit and binding particles away and the larger stones will soon become loose and the road will break up more or less and wear into ruts and holes.

Observation shows that the construction of gutters in connection with park drives is a great deal a matter of custom and habit with park engineers and superintendents. These gutters are expensive and ugly and in many cases are entirely unnecessary. A well constructed macadam road properly provided at intervals of from 150 to 200 feet with catch basins will not need gutters for low gradients. Drivers dislike to drive into the stone gutters, so that the actually usable part of the road is the space between gutters. Hence if the road is at all narrow, it is often advisable (where gutters are necessary) to add them outside of the width adopted for drives where gutters are not necessary. Where circumstances admit of it, it is a very good plan to form a broad, shallow gutter in the turf adjoining the drive along the uphill side. In a great majority of cases storm water from the side slopes in parks is allowed to flow upon the drive and it is this great accumulation of storm water which has to be taken care of in wide and deep paved gutters; by cutting off all this storm water from the uphill side of the drive, the drive will be but little washed in storms provided the grade is not excessive. The storm water can be safely carried in such turf gutters at any ordinary grade for considerable distances, once the turf is thoroughly established. It is well to provide an inlet wherever a catch basin is placed so as to take this storm water underground, but where the expense of catch basins and long storm water drains cannot be afforded, a pipe culvert can be run across the road to deliver this storm water on the surface on the downhill side. Such provision for taking care of storm water is particularly essential in all earth roads. Such turf gutters are often economical in the long run, even though they may involve a large amount of additional grading in the first instance.

As to the width of drive, I find that in the great majority of cases a width of 24 feet, exclusive of paved gutters, amply meets all requirements except in a few places where either for dignity of effect or to accommodate a special accumulation of traffic greater width has to be adopted. With this width a slow moving carriage, occupying (as it does naturally) the centre of the drive, can be overtaken without the delay and inconvenience incident to waiting for it to be driven out of the centre of the drive, which will be necessary in the case of a drive only 18 feet wide. I have often observed a lack of appreciation on the part of designers of a suitable relation between the rate of curvature and width of drive. The wider a drive the more gradual should be the rate of curvature. I have seen many instances of comparatively wide and dignified drives yanked around sharp corners as quickly and with as small a turn as one could reasonably use for drives 15 or 16 feet wide. Such a sudden turn not only looks very bad, but almost inevitably everyone drives around the short side of the curve, resulting in inconvenience when carriages have to pass each other on the turn and leaving a large part of the width of the road almost unused. Another bad thing in curves is to have a wiggle but little (if any more) out of a straight line than the width of the road. Unless there is very marked topography to justify such a wiggle, it looks very bad in perspective. But the worst in alignment is to introduce compara-

tively short pieces of straight drive between curves where the surroundings are improved in an informal style. The formality of the straight parts in such cases is utterly out of harmony with the surroundings.

JOHN C. OLMSTED.

Brookline, Mass.

There is no better subgrade for a macadam park road than gravel well drained. The loam holds the moisture well and binds the gravel. On such a subgrade no road for pleasure travel needs more than six inches of macadam. Clay, if well drained, need not be removed from the subgrade, and it is my experience that any well-drained subgrade, on which a macadam road can be finished with a 15-ton steam-roller, will stand. I have built several pieces of road on clay that was so boggy, from the water used in surfacing, that it was necessary to finish with horse rollers. We have no better roads than these, and they have been in use thirteen years.

Gutters should be made of something smoother than granite blocks or cobbles, and can safely be omitted on grades less than 2 1-2 per cent. The crown should vary with the grade; one in thirty is a very good crown for grades under 3 per cent.; it sheds the water well and is comfortable to ride over. On grades steeper than 3 per cent., I think it is a good practice to make the crown the same as the grade. To avoid sending gravel to the middle of the road, make the crown nearly straight from centre to side.

Two teams can pass comfortably on a 16-foot road, 3 on a 24-foot road, 4 on a 32-foot road, and, except for landscape effects or to allow for overhanging bushes, intermediate widths are not needed. These widths are, of course, exclusive of rough gutters. The top layer of macadam, about 3 inches thick, should be of stone, varying in size from about 1 1-2 inch to about 5-8 of an inch; and, for park travel, I believe that a hard argillaceous stone is better than trap. Plant the roadsides, but do not, by over planting, hide the beauties that the road was intended to reveal.

God bless the man who will devise some economical and satisfactory means of preventing dust on the macadamized road. Dust is one of its weakest points, and the coming of the automobile has emphasized it. We are experimenting with a dust preventer called "Westrumite." It is said to be composed of ammonia, tar, crude petroleum and caustic soda. It is a brown liquid of about the same specific gravity as water, mixes freely with it, and is applied to the road with an ordinary watering cart.

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Boston, Mass.

Engineer Park Department.

Park roads, unfortunately, are a necessity. This being so let us hide them as much as possible within the woodlands. Not, however, so much so as to nullify the purpose for which they are intended; that is, to afford a means of viewing the beauties of the park from vehicles. Let us, then, treat them as a means to an end—super-

numeraries, as it were—while Nature holds the front of the stage. And let us plant our roadsides, occasionally letting the fringe of bushes intrude over the edge of the road thus softening the hard lines so often apparent; our native material does the thing admirably.

Seeing that we must have roads in parks, have them well built, and that, too, without unnecessary expenditure of money. For ordinary park use a road of six inches in thickness of road metal when rolled is ample, provided the sub-bed is properly made. Our experience convinces us that neither clay nor loam need to be excavated from the sub-bed to a depth lower than four inches, as a sand layer of this thickness will prevent the clay or loam bottom from moving. Having drained and graded the sub-bed to a point six inches below finished grade, the top four inches of the sub-bed being sand or fine gravel, the operation of making a road is very simple. First, lay sufficient good broken stone, of 2 inch to 3 inch cubes, to make four inches when rolled; add enough stone screenings or coarse bank sand to fill all voids; water and roll well, first with a light roller; care must be taken that the stone is spread over the sand bed, not through it by the churning of the wagon wheels. Over a clay bottom everything depends on the integrity of the layer of sand. For the surface a good wearing stone should be selected, a tough-textured trap-rock is the best, granites are usually too hard and brittle, they grind under travel and require unusually good binding material; of limestones, some are good. The question of the surface stone, however, must be decided by what may be available in the locality. Two inches of stone, of 1 1/2 inch cubes, when rolled, is sufficient for a surface course. This course should be bonded with clean, sharp stone screenings. Again water and roll with heavy roller, adding 1 1/2 inch cube stone to fill up any depressions that may occur, until the road is firm and true to section; a sprinkling of stone of 1/2 inch cubes may then be spread and rolled in, and the road is ready, after drying out, for travel. It may be again emphasized that only enough screenings should be used to fill interstices and bond the road, leaving no surplus on top.

Telford foundations, even though made exactly as prescribed by the inventor, cannot be as stable as those made of macadam, because of the unequal bearing of the stones relatively with each other on their beds. Macadam comes nearer to it, in addition to its better bond.

J. A. PETTIGREW,

Boston, Mass.

Superintendent of Parks.

Goodwin Park drive is two miles long and 24 feet wide. The stone bed is one foot deep, and was filled in three different layers, viz.:

6 in. footing stones rolled,	10 in. loose
6 in. 1-inch and 2-inch trap rock, mixed,	9 in. loose

screenings and dust added sufficient to fill all crevices and to produce a smooth surface. We found on a hillside in the park, where we were looking for gravel, a layer of porous stone, which turned out to make an excellent material for the footing of the

road, one of its good qualities being to absorb and maintain moisture. Under this deposit we found a good deep strata of trap rock of medium hardness, which promised to furnish excellent surface material. Having all the required material for the building of a good road on the ground, we made good use of it in the following manner: We hired a stone crusher, a steam drill, and a steam roller, from Nov. 1st to May 1st, at the following rates per day:

Steam crusher and service of one engineer,	\$8.00
Steam drill and service of one driller,	4.00
Steam roller and service of one engineer	8.00
	\$20.00 per day.

We furnished the coal and all other necessary labor, dynamite, powder, etc. The ordinary labor cost us 17 1-2 cents per hour; foreman 25 cents, and double teams 45 cents. The average cost of the broken stone was 77 cents a cubic yard loaded on the wagons. We started operations first week in November and worked all winter. The last week in December we were obliged to stop operations on the road on account of frost, but we kept on with the quarry operations, delivering the broken stone and screenings on convenient places along the side of the road. The sub-grade of the road was properly graded to be parallel with finished surface grade and then rolled. The footing stone was then put in and also thoroughly rolled. Only dumping stock wagons were used in bringing stone material on the road, and no dump carts. I believe that the sudden dumping of a heavy body of stones in a solid mass causes the stone to become more packed on the very spot of dumping, leaving a less compact area on the outside of that spot which even the steam roller will not level up, and later on these spots will be noticed in the form of small bumps.

The layer of trap rock in 1-inch and 2-inch size mixed was only put on after the footing stone had been rolled solid to the desired grade, and was then also rolled until absolutely true and smooth to proper grade. So far all the stone was carted right on to the road-bed, but not so the screenings. No vehicle of any description, outside of the 6-inch tire watering cart, was allowed on the road from the time it was ready to receive the screenings until finished, and the application of the finishing course of screenings was done in the most careful and thorough manner as follows: Two dump carts of screenings would be driven along the road, one on each side, and the driver and one additional man to each cart would take the screenings and spread them with the shovel over the surface of the road in front of the roller, in the same manner as one would spread commercial fertilizers on lawns, for instance. The roller was kept working forth and back continuously and the fine screenings applied in the manner described would work itself in between the interstices of the stones, by the movements of the stones produced by the pressure of the roller. Water was continuously applied, just enough so that the screenings were wet enough to prevent their sticking to the roller. This operation was kept on right along, taking in a section of about

150 to 200 feet at a time until no sign of the 1 and 2-inch stone became visible by the washing of the watering cart, and the surface obtained in this manner was so smooth, compact, and concrete, comparing favorably with the best surface of an asphalt pavement. This last described operation may seem unnecessarily laborious, but it is worth while to do it, for the concrete stability of the wearing surface is the most effective defence against the aggressive action of tear and wear of traffic, and the best of sub-foundations will not make a road smooth and pleasant as a park drive should be, if its surface is coarse and loose.

This driveway has now been in use for three seasons and has seen considerable traffic, yet it is today almost as smooth as it was at the beginning, although we have not been able to water it during dry weather in the summer. I attribute its remarkable lasting qualities without the necessary care (for I consider the sprinkling during dry weather an absolute necessity) to two causes: first, to the concrete form of the surface layer; second, to the efficient characteristic qualities of its bed of footing stones as an underground reservoir of moisture, on which the surface draws during dry spells of weather.

The expense of construction of this drive including sub-grade (not exceeding 2 ft. in fill or cut), and turfing of borders two feet wide, was \$8,000 per mile or \$1.50 per running foot, or 6.3 cents per square foot, which I consider a very low figure for the quality of road produced.

THEODORE WIRTH,

Hartford, Conn.

Superintendent of Parks.

I am pleased to notice it is said in our bulletin that "for ordinary park use a road of six inches in thickness of road metal when rolled is ample, provided the sub-bed is properly made." In some of the park systems of this country, telford macadam roads have been constructed of eighteen inches in thickness. The cost of this is so great, that to suggest it in some cities for park roads is at once prohibitory. Boston has the best park roads in the country, and if good roads can be made by Mr. Pettigrew's concise and clear statement of how to do it, good park roads can be built to a considerable extent without indulging in lavish expenditures.

In Highland Park, Rochester, an experiment was tried in 1892 with grass walks. There was a shrub collection on a southern slope on which walks were graded ten feet in width. As most of the grades were quite steep, it was a problem how to construct walks cheaply that would not wash or erode in rains. We decided to sod them, and as the walks have now been in use ten, and twelve years, we can emphatically say that the grass walks in question have been most successful and satisfactory. They are kept closely mowed, and they are wide enough, so that there is no tendency to make "beaten tracks." At some points where people enter the collection, and where traffic is congested, of course the grass wears out and needs renewing in two or three years, but these areas are very small. In a moist season

like the present, the appearance of these grass walks is very pleasing, and women particularly are fond of walking on them.

At the Arnold Arboretum, Dr. Sargent has been establishing grass walks, which are kept closely mowed, and as they wind through the woodlands, and the large collections that comprise that magnificent living museum of trees and shrubs, they answer the purposes of accessibility, unobtrusiveness, and simplicity.

Rochester, N. Y.

JOHN DUNBAR,
Assistant Superintendent of Parks.

Ashes and Cinders for Filling.

My experience has been that the ashes and cinders left from the combustion of coal are most useful for filling low lands where it is desired to float the filling rather than attempt to fill to the bottom. For such places they are particularly useful because of their lightness and permanency.

Another and more important use is for ballast behind retaining walls and bulkheads. We have built in the past few years several timber bulkheads along the water front and used no other form of ballast with marked success. In one case the bulkhead was used to retain clay filling 14 feet deep and has shown no sign of weakness. The ballast was only 10 feet in width on top on an average, in places only 3 or 4 feet.

Cinders and ashes have in the main a certain degree of elasticity which enables them to receive a thrust without transmitting it to the retaining structure.

The City of Cambridge in former years built their sidewalks in the lower portion of the city almost wholly of house ashes. The only trouble experienced was during the warm days of spring when the walks would "track" disagreeably.

Medford, Mass.

EDWARD P. ADAMS,
Engineer of Parks.

Herbicides.

Such herbicides as have come under our notice seem to be too expensive for use over large areas. This opinion is based on judgment as to how much ground a certain quantity of the herbicide would cover, as compared with packing-house refuse salt at \$2.00 per ton—the price we have to pay. I noticed a machine in Milwaukee a few years ago, used for melting asphalt pavement in the street when patches were required. It was a gasoline heater about 4 ft. by 2 ft. 6 in. mounted on wheels; the jets projected from the bottom and produced a sheet of flames, which would surely kill off walk or road weeds. Salt has served our purpose so cheaply and well that we have never tried the blazer.

Boston.

J. A. PETTIGREW,
Superintendent of Parks.

Evergreens for Parks.

The winter of 1903 and 1904 throughout the North and North-eastern states will be memorable for the persistent intensity of its cold, from about November 25th until nearly April 15th.

The average winter temperature for Rochester, N. Y., and vicinity, since the Government Weather Bureau was established, is 25.8 degrees. The average temperature for last winter was 19.6 degrees, and was the coldest winter in the records of the Weather Bureau.

Many evergreens—coniferous evergreens particularly—were put to the severest test. Some that were considered reliably hardy were severely injured. As far as our observations have extended, coniferous, and some other evergreens, suffered much more severely from the effects of the cold than deciduous trees and shrubs.

Our late experience has compelled us to restrict to narrower limits the list of hardy evergreens. A few that we have on former occasions vouched for as being hardy, have, much to our surprise, suffered so severely from the effects of the past winter that it will take them a long time to recover.

It is quite noticeable from the effects of last winter, that different evergreens are differently affected by cold. For example, some were injured by the sweep of cold northwest winds, but not apparently by the winter's sunshine, while others were seriously affected by both direct sunshine and cold winds, and others again were much hurt, that were well sheltered from both sun and wind. For instance, Thunberg's pine, at the base of a northern slope and fairly well sheltered from winter's sun and cold winds, was badly injured, but in a more exposed situation came through in much better condition.

It is really perplexing sometimes to give a rational explanation or to find out the real cause why evergreens, and other plants, that appear to be hardy, at last succumb to cold, under what appear to be extremely conflicting conditions. There are really many factors that enter into the hardihood of plants outside the direct influence of cold, and they are frequently difficult to ascertain.

In a horticultural, or gardening sense, we usually speak of evergreens for park and gardening ornamentation, as "flowering and coniferous."

In the "flowering evergreens," of course, the most important are the rhododendrons. Throughout Massachusetts, Connecticut, and eastern New York, rhododendrons are planted in large quantities.

Judging from the correspondence in the horticultural papers lately, many rhododendrons were killed, and many severely injured by last winter's cold. The rhododendrons, however, in Highland Park, at Rochester, came through remarkably well, and made a fine floral display. Of course, the plantations are young, the oldest not being more than seven years.

The soil in Rochester is limestone. The beds for the rhododendrons are excavated to about an average depth of two and one-half feet, and filled with humus or soil of a peaty nature, to which rotted cow dung is added in large quantity.

Rhododendrons are far more susceptible to injury from the sweep of cold winds than from direct sunshine. These in question are thoroughly protected by the lay of the land from the north and north-west, but there is little protection from sunshine, excepting over some beds where the branches of deciduous trees extend; but we noticed last winter that that afforded only a slight advantage over those who had absolutely no protection from direct winter sunshine.

In the growing of the hardy hybrid *catawbiense* rhododendrons there are four essential conditions:

- 1st. A soil full of humus free from lime.
- 2nd. Absolute protection from the sweep of the prevailing winds.
- 3rd. Abundance of water, but perfect drainage.
- 4th. Heavy mulching with leaves, or other similar frost resisting material over the roots.

The varieties of rhododendrons we have found useful are as follows:

C. S. Sargent, rich crimson; Mrs. C. S. Sargent, pink; Charles Dickens, bright scarlet; Alexander Dancer, bright rose; Sefton, dark maroon; Lady Grey Egerton, silvery white, a beautiful variety. *Everestianum*; rosy lilac; *delicatissimum*, blush white; *album elegans*, light blush or pale pink; *album grandiflorum*, light blush, fading into white; Hannibal, rosy-red; *roseum elegans*, deep rose; Charles Bagley, cherry red; *atrosanguinea*, blood red; *kettledrum*, purplish crimson; F. L. Ames, rosy pink; Mrs. Milner, crimson; H. H. Hunnewell, rich crimson with edges of petals beautifully crinkled, a handsome form. H. W. Sargent, dark crimson; Guido, deep crimson; *coerulescens*, pale lilac blue.

In the above list Charles Bagley and *album grandiflorum* were somewhat injured during the past winter, but they had a fair show of flowers.

Some of the dwarf alpine rhododendrons are very hardy, useful ornamental subjects. *R. ferrugineum*, *R. hirstum*, *R. myrtifolium*, *R. Wilsonianum*, *R. ovatum*, and *R. Dahuricum*, are very useful hardy ornamental subjects, and are well adapted for planting on the outside of groups of the larger hardy kinds. And by the way, we find that *Dahuricum*, *Wilsonianum* and *ferrugineum* will thrive remarkably well in lime stone soil.

The mountain laurel *Kalmia latifolia* is an exceedingly useful and decorative evergreen where the soil is adapted to it, and given the proper conditions, it looks well in the winter months, and hardly ever suffers from intense cold.

Kalmia angustifolia and *K. glauca* are pretty small-leaved hardy evergreens, and thrive under similar conditions to the common mountain laurel.

Leucothoe Catesbaei, which is found growing abundantly in North

Carolina, is a beautiful hardy evergreen and very useful for park ornamentation. It requires planting under moist conditions.

Andromeda floribunda and *A. Japonica* are choice evergreens, and while they appear to be quite hardy, they are somewhat capricious about the conditions that suit them. They are well worthy of careful attention. The pretty little narrow-leaved *Andromeda polifolia*, which is a native of many of the sphagnum bogs of North America, does remarkably well in ordinary light, loamy lime-stone soil, and forms handsome dense groups. It can be used to excellent advantage in planting around the margins of lakes and ponds.

The scotch heather is one of the hardiest of the heaths, and masses of the purplish blossoms have a pretty effect in August.

Two other good hardy heaths are *Erica carnea* and *E. vagans*, and are of easy cultivation.

The bear-berry (*Arctostaphylos*) which covers the ground so thickly with a dense carpet of green in many places along the Atlantic coast, is a pretty small leaved trailing evergreen, but it is somewhat difficult to establish under cultivation. Where success can be attained with it, it is well worth the effort.

The American holly *Ilex opaca*, is a most useful evergreen for parks where it will thrive. Rochester, however, is about its northern limit, and its growth is so slow that its decorative value is of little account.

The crenated holly from Japan, is a handsome small-leaved evergreen of slow growth, but it was partly injured during the past winter in Rochester. It is, however, fairly hardy.

Amongst the evergreen, euonymuses, *E. radicans* is hardy and useful. It was injured last winter, but it started into growth so freely in the spring that the damage was of no account. We highly recommend this evergreen vine for many situations in parks.

Amongst some other small evergreens are the garland flower *Daphne cneorum*, the rock rose, *Helianthemum vulgare*, both perfectly hardy, and *Pachysandra terminalis*, a low growing evergreen plant that does remarkably well in dense shade.

There are some pretty forms of the box (*buxus*). Of course they are somewhat stiff, but there are occasionally formal conditions in parks where they can be introduced; they were slightly scorched at Rochester last winter.

Amongst the coniferous evergreens, the pines take first rank from the ornamental standpoint.

Our native white pine easily takes priority in ornamental merit. We have before emphasized the importance of planting it in sheltered places, for although it is a common native, it suffers severely if planted in bleak situations, and this has been very forcibly demonstrated during the past winter.

The red pine has, during the past winter, risen very high in our estimation. In the most bleak situations it was not injured in the least by the sweep of cold winds. In its young state it is highly ornamental, but as it attains maturity, it loses all the lower branches.

We were highly pleased with the behavior of the ponderosa pine

from Oregon and California, during the past winter. It shows no ill effects and it is a very handsome evergreen.

The swiss stone, corean, monticola, mugho, austrian, scotch, pitch, jack and table mountain pines are all perfectly hardy, and in ornamental value are about in the order named.

There are few coniferous evergreens that stand the sweep of cold winds with the virility of the scotch and austrian pines, and they really live longer years of usefulness in this country than they are given credit for.

Most of the spruces in cultivation appear to be fairly hardy. The oriental spruce from the regions around the Black Sea, a very handsome specie, was slightly injured during last winter.

Engelmann's, Douglas and pungens spruces are absolutely hardy and reliable, and should always be planted. The black, red and white spruces have not the ornamental value of the former, but there is room for them in parks.

We have absolutely no use for the Norway spruce under any circumstances.

The hemlock spruce is one of the most beautiful of native evergreens, but it is a tender native. It is useless to plant it in bleak situations. To look comfortable and happy plant it in a moist situation well sheltered from the sweep of cold winds. Carolina, Patton's and Albert's hemlock spruces suffered slightly during the past winter, but the plants at Rochester are too small to pass any opinion upon them yet.

Amongst the firs, undoubtedly the white fir from Colorado, *Abies concolor*, is the hardiest and most ornamental.

Nordmann's and cephalonian firs were badly scorched during the past winter. In normal winters, however, Nordmann's fir is satisfactory. There are specimens in the Ellwanger & Barry nurseries at Rochester between fifty and sixty feet in height.

For some reason the balsam fir generally looks wretched in cultivation after a few years. Frasers fir from the Alleghanies is much superior to it.

There are a great many varieties of the native *arbor vitae*, and all with more or less prim and stiff forms, but they are useful in many situations in parks.

Siberian, Hovey's, *vervaeneana*, and *pyramidalis* varieties are of absolute hardness.

Amongst the yews, the Japanese *Taxus cuspidata* is one of the best and appears to be remarkably hardy. A yew frequently sold under the name of *Taxus cuspidata* variety *brevifolia*, which we are inclined to believe is the Japanese *Taxus adpressa*, or form of it, appears to be very hardy, but the habit is stiff.

The native yew, or ground hemlock *Taxus Canadensis*, is most excellent for planting in shady conditions.

The different forms of the English yew are usually scorched with us in winter.

The junipers are excellent subjects for park planting, and we have always had admiration for the red cedar, or Virginia juniper. It is regarded as one of the most virile and hardy of evergreens, but

whether from the effects of last winter, or from some insidious fungous trouble, we have not yet determined; but a number of red cedars around Rochester present a severely scorched appearance at this time.

The savin juniper and its different varieties are admirable subjects for covering banks and slopes, and are perfectly hardy, and the prostrata, squamata, and communis junipers are equally good. The chinese and siberian juniper (*J. rigida*) did not show any traces of injury during the past winter.

The Nootka Sound cypress, *Cupressus Nutkaensis*, behaves well so far, and appears to be perfectly hardy.

The Japanese retinosporas are not satisfactory with us, but in their case it appears to be more soil or climatic conditions that affects them, as they appear to be hardy enough.

In urban parks where smoky conditions prevail, the planting of coniferous evergreens is almost useless. Observation and experience teaches that hardly any of them will look happy in a smoky atmosphere. But in rural, or suburban parks, not invaded by city smoke, the hardy pines, spruces, firs and some others indicated, should always be planted to a certain extent. They look so cheerful in the dreary winter months, and their forms and outlines are comely and beautiful at all times of the year, this is strikingly so in their youthful days. They do not impoverish the soil around them nearly to the same extent as deciduous trees, their leaves are not troublesome in creating litter, and they rarely are injured by violent storms. They can easily be restricted in growth and area, if so desired, without much trouble by disbudding and pinching, and this can be done so intelligently and skilfully that the means employed to accomplish this end can hardly be detected.

The best time to plant coniferous evergreens is in spring, when the buds begin to perceptibly swell, although we have planted them at almost all seasons of the year, except mid-winter, with more or less success. If the ground has been well saturated with rains, the end of August, or first of September, when the summer's growth is about completed, is a good season for planting.

With but few exceptions, all coniferous evergreens are partial to a light sandy loam with a gravelly, or porous subsoil, and good natural, or artificial drainage is essential.

Evergreens are attacked by various insect pests, and one of the worst with us is the mite known to horticulturists as "red spider." It can be kept under control by frequent applications of water applied under pressure.

In some sections of the country, the drop-worm, or bag-worm, the larva of which surrounds itself by a case or "basket" constructed of the leaves on which it feeds, is injurious to coniferous evergreens, and particularly troublesome to arbor vitae. We have not observed any trouble from this insect in western New York.

Sometimes coniferous evergreens (particularly some of the pines) when in the best of health and vigor, will die with what looks like mysterious suddenness. This is due, generally, to some sudden fungoid, or bacterial trouble

The late Josiah Hoopes, who wrote an admirable treatise on "Coniferous Evergreens" made the following statement:

"A rich soil abounding in organic manures, is, no doubt, one of the chief causes that produce unhealthiness in coniferous trees by inducing a strong succulent growth which rarely allows the young tree sufficient time to mature its wood, and consequently, if not killed by severe cold, it very frequently becomes in a manner diseased." . . . "The most rational cause that we can assign for the appearance of blight in the family of conifers, is that due to a too luxuriant growth."

Josiah Hoopes had an excellent practical knowledge of conifers and we believe his observations on this point were correct.

Outside of the coniferous evergreens, the number of "flowering" and other evergreens suitable for planting in ornamental grounds in this latitude, is really not large, or of that nature that will produce any very marked or broad effect on our landscapes.

Rochester, N. Y.

JOHN DUNBAR,
Assistant Superintendent of Parks.

Mr. Dunbar's observations regarding the coniferous evergreens, agree in the main with the experience of our park men here in Buffalo; though the environment in Rochester is much more favorable to this class of trees, than with us, and many species can be grown in Highland Park that would not live here. I should place somewhat different values on the species—for instance, I would place the Norway spruce among our six best conifers for park planting, and would place the scotch and austrian pines near the tail end of the list of hardy species. The norway spruce, where supplied with sufficient food and given room to develop, is a noble and beautiful object, from its spreading matted base to tapering spire. It is among the hardiest and is adapted to a wide range.

The retinosporas all burn in our brief seasons of winter sun, but of the species we grow, none seem to be injured by cold alone. Nordman's spruce was killed to the ground last winter except where thoroughly protected by nurse trees. Our plants were all young, however, and it is possible that as they get older, they may become more resistant.

With us, the typical ironclad seems to be the Colorado spruce (*Picea pungens*). Englemann's spruce, and the concolor spruce both seem well adapted to our locality.

Most of our red cedars were killed last winter as were also the oriental spruce and polita.

One thing we have learned to dread is drouth in winter. In summer we can water and mulch in a dry time but in winter it is not so easy.

In broad leaved evergreens we are restricted both by our wind swept locality and the abundance of lime in our soil and water. Rhododendron and its allies we grow only sparingly and with a few exceptions those grown are unhappy. Of Euonymusses we grow three species of evergreen character, and some box trees, which do well where shaded in winter.

For low growing plants we find *Berberis aquifolia* most admirable,

though some of our plants are injured in the winter, but the new growth quickly obliterates all signs of it.

Two of the *Cotoneasters* do pretty well here and have the added advantage of persistent fruit. Of course *Daphne cneorum* is hardy. For ground cover plants in the evergreen way we also grow the evergreen honeysuckle and *Teucrium chamedrys*, which makes a dense mat of the deepest green.

In taking an account of our evergreens the yuccas should not be forgotten. Both *filamentosa* and *glauca* are quite hardy here, when given perfect drainage. They will not stand surface water nor stagnant soil water.

For many situations these seem to me to be admirable and their inflorescence is good.

In the transplanting of conifers I do not see any advantage in waiting until growth begins. We commence planting in spring any time after the middle of April. If transplanted late in the fall, the plants must be heavily mulched to prevent the roots from freezing, and the tops should be protected from drying winds.

One pest of the pines of the *strobis* group not mentioned by Mr. Dunbar, is the woolly aphid which attacks not only the bark of the stem and branches, but the roots also, and often causes serious injury before being discovered. A mulch of tobacco stems placed about the base of the tree or watering with a strong solution of tobacco will usually kill this pest.

Buffalo, N. Y.

JOHN F. COWELL,
Superintendent South Park.

Superintendent John F. Cowell in commenting upon Mr. John Dunbar's instructive paper on "Evergreens for Parks" says that he "dreads drought in winter." My own experience—with the few native varieties of evergreens—has been a long one, and it has taught me to seek an even condition of soil moisture for all seasons.

The finest specimen of laurel (*Kalmia latifolia*), growing under natural conditions in this vicinity, is about sixteen feet in height and perhaps fifty to sixty feet in circumference, more than three or perhaps four times the size of other thrifty specimens observed in this section. This shrub is heavily furnished with rich, dark green and glossy foliage, and with a superabundance of flower clusters in their season. The annual growth is remarkable for its size and evenness, year by year.

This great shrub stands in a food and mulch collecting hollow on a hill side, in which the soil is perennially moistened and kept at an approximately even temperature by the adjacent waters of an unfailing spring. Contrasting with this in a striking manner is another specimen of the same variety standing where it was planted some thirty or more years ago, in soil which contained superficially the average amount of scanty humus usually observed in inferior private lawns, the subsoil consisting of glacial drift and far removed from any water supply. This poverty-stricken specimen has not only grown imperceptibly during all these long years, but it has lost some of its branches from decay, and blooms very imperfectly if at all.

The finest wild specimen of hemlock (*Tsuga Canadensis*) of which I have knowledge grew to a great size under soil conditions quite similar to those of the great laurel, while other specimens of hemlock planted near by, in soil conditions similar to those in which the impoverished laurel languished, showed more vitality than the latter, but made very little wood, and their foliage was inferior in color to that of the great tree. It seems to me that these specimens fairly illustrate the needs of their varieties.

The fact that the leaf functions of evergreens lessen but do not cease entirely in winter is in itself a demonstration of their need of moisture at that season. This moisture, to be available, must be below frost and within reach of portions of the root systems. It is inconceivable that the frost bound portions of the root areas can derive sufficient water, if any, from the frozen soil encasing them. A total absence, due to freezing, of available water, as well as a similar lack caused by a drought must work serious, if not fatal injuries to all evergreen vegetation.

Trees, and presumably other forms of vegetation, have a singular and interesting power of directing their roots to distant or exceptional food supplies, often suggesting animal instinct, and occasionally even reason itself.

The study of street trees, among which may be found many which have been more or less seriously injured and decayed, has brought to my attention many curious and even wonderful illustrations of this power.

For example, I have noted several varieties of deciduous trees which have sent out true roots from the cambium tissues high above the soil to feed on the adjacent decay of their own trunk tissues. Normal roots in the soil have been found which had reversed their outgrowing tendencies by bending inward toward the tree body, to end in entering their own trunks, which had been hollowed by decay, to find nourishment of a quality denied by the exhausted soil. Among the varieties affected in this way I note the *Ulmus Americana*, *Acer saccharum*, *A. rubrum*, *A. saccharinum*, *A. platanoides*; *Aesculus hippocastanum* and *Quercus alba*.

This discussion has hitherto been confined to conifers sufficiently advanced in growth to have roots reaching deep into the subsoils beyond the possibilities of freezing. In the cases of such newly planted small trees in regions of frost so severe as to shut out the young roots from entering the unfrozen and moist sub-soil, it must be evident that the frost-bound roots will remain as dormant while the cold lasts as those of the deciduous trees do naturally.

As it is contrary to the nature of evergreens to become dormant at any season, the effect of such exposure must be either injurious or fatal. It is not conceivable that it should be wholly harmless. Such small trees must therefore be protected by a heavy mulch which will either sufficiently prevent freezing of the soil about the roots, or lessen it sufficiently to leave a portion of the root area in the unfrozen sub-soil.

I know of no mulching material which compares favorably with

wood sawdust for this purpose. In its dry state it is a nearly perfect non-conductor of heat, and when wet it will freeze and still protect the root from serious injury. In warm weather it will absorb and conserve moisture, thus preventing injurious effects of drought. In decay, as has been shown, it furnishes a food which the tree will make great and seemingly abnormal efforts to reach.

This mulch should be maintained, at least until the roots have extended into the soil beyond the liability of freezing.

I have used this material as a mulch and as a fertilizer for many years with excellent results and with an increasing appreciation of its usefulness and value. After all it is but an imitation of Nature's way of caring for the great forests.

Some years ago I directed the attention of some interested friends to the starving condition of large areas of the woodlands in Central Park, New York, explaining the great value of sawdust mulching liberally applied as being the cheapest, quickest and surest method of reviving trees starving for lack of both food and moisture. These friends urged me to publish my ideas for the benefit of the park.

I decided, however, to await an opportunity, now afforded me, of submitting the question to a learned, disinterested and experienced body of horticulturists, of which I now have the honor of membership.

FREDERIC SHONNARD,

Yonkers, N. Y.

Superintendent of Parks.

I have read with much pleasure and profit Mr. Dunbar's paper on evergreens for parks. I think, however, he is a little hard on Norway spruce; he can't have seen the specimens on the Hunnewell lawn at Wellesley, or that on the old home place of Robert Douglass at Waukegan, Ill.; examples like these cover a multitude of sins in this much abused plant—much abused because it has been abused in its use. Such an adaptable evergreen should not, I think, be knocked down and pounded when it is down; even though we don't like to use it in our parks, a place can be found for it.

It is regrettable that Mr. Dunbar found Thunberg's pine injured last winter; we had hoped for great things from it.

Pachysandra terminalis is a good plant for shady places, as Mr. Dunbar says. Planted in *Rosa lucida* borders, it forms a pleasing ground on which, in winter, the red stems and hips of the roses show to advantage.

Unless scientific firing of soft coal is enforced, it would seem that the planting of conifers in the Boston parks will be wasted effort, ending in disappointment. The coal strike of last year encouraged the use of soft coal, and the laws governing the smoke nuisance seemed to have been held in abeyance, to suit the emergencies of the case and have not since been enforced; the result is that conifers are showing the effect of damage from smoke. I would say, for permanent effects in parks located in or near large cities or manufacturing centres, do not depend on conifers; rather plant deciduous trees.

J. A. PETTIGREW,

Boston, Mass.

Superintendent of Parks.

Fertilizers.

I do not remember this subject's being mentioned in the Bulletin. It is of interest to all more or less. We have found nothing superior to Colorado sheep manure, as it is easily applied, quick in results, and is lasting, but the price is prohibitory for use in public parks. Wood ashes and bone meal, we find the next best fertilizer. Do not mix them together to apply them. Distribute the ashes in the fall before the ground freezes, one ton per acre, the bone in the late spring or early summer, one-half ton per acre. The ashes take a longer time to dissolve, and when both are applied at the same time, the potash liberates the ammonia in the bone, which passes off into the air. The bone is applied at a time when most needed, nourishing the grass through the dry season. There is nothing to be seen after the first rain, nothing to rake up or pulverize, as in the use of stable manure. Therefore, it is cheaper than fresh stable manure delivered free.

Worcester, Mass.

J. H. HEMINGWAY,
Superintendent of Parks.

The best and most economical fertilizer for top dressing park lawns, if these have not been too much neglected and run out, I have found to be good, screened, hardwood ashes. I purchase about fifty tons of these every fall and spring and apply the ashes with a horse spreader, so adjusted as to sow the ashes evenly. Under trees, along narrow borders, and wherever the spreader cannot conveniently go, laborers sow the ashes by hand, using rubber gloves over their hands. The application is made, if possible, just previous to a rain, or during a fine rain, although this is not by any means imperative, if the ashes are a little damp.

Unleached hardwood ashes, well screened, are delivered f. o. b. cars at Albany, N. Y., for \$9.00 per net ton, freight paid. As there is no raking off of waste material, and the application is inexpensive, I find ashes at this price for the results obtained, more economical, and as satisfactory as more expensive fertilizers.

However, I should not continue to use ashes year after year, but every third or fourth year, to resort to ground bone, sheep manure, or some equally good material, for a change.

The street department of this city has accommodated me for the past two or three years by dumping at convenient points, under the health department regulations, the street sweepings of midsummer and the fall season. The midsummer season furnishes very clean material mostly horse droppings, mixed with soil and sand. The fall supplies tree leaves in great abundance, mixed with street detritus.

These materials, when piled, turned over, and composted with soil and slacked lime, I have found to be excellent for top-dressing. What

fertilizing qualities are not found continuously and permanently in the wood ashes, are found in this compost, if properly worked over and prepared.

I know of nothing more deadly and injurious to vegetation and the proper maintenance of a lawn, than the hot, fermenting street sweepings of a city applied in a crude condition and not composted or mixed with other material. I cannot, therefore, recommend street manure or sweepings for top-dressings unless treated as described.

Albany, N. Y.

WM. S. EGERTON,
Superintendent of Parks.

We prefer stable manure to anything else for top-dressing lawns, one reason being that we get it delivered for about \$1.25 per cord, which is quite a low figure. It should be applied before the grass stops growing in the fall, as it gives the grass a strong growth in the fall and, consequently, a better result the following season; one strong point is that it is quite a protection in the winter, especially to a young lawn, while other fertilizers are of no benefit in this respect.

In getting it ready for use, pile in a water-tight vat or pot so as to save the liquid; it can be thoroughly rotted in about four months if turned and watered. We use from six to eight cords to the acre, and where the ground is poor, apply it in the middle of summer as well as in the fall. In making new lawns in the summer, by using a light cover it acts as a mulch as well as a fertilizer for the young grass.

Seattle, Washington.

J. W. THOMPSON,
Superintendent of Parks.

In treating some pasture lands in one of our parks some distance from the city, after clearing of stone, plowing, summer fallowing and a second plowing crosswise, we applied the following combination:

800 lbs. fine ground bone	} per acre.
400 lbs. muriate of potash	
200 lbs. nitrate of soda	

This was spread on before harrowing, which was done in the most thorough manner, and the usual seeding and rolling followed. The result has been very satisfactory.

In one of our large cemeteries that comes under my supervision, we have abandoned the use of stable manure as a lawn dressing, and now use wood ashes, fine ground bone and some nitrate of soda.

We believe in "change of diet" so use different fertilizing material, rarely using the same more than three years in succession.

Worcester, Mass.

JAMES DRAPER,
Secy. Park Board.

In the use of fertilizer it has been our experience that the change of the material used every other year is of great benefit to the lawns. In one year we treat the lawns to a generous coating of well-rotted short horse manure which we start spreading as soon as the ground is

sufficiently frozen to permit of trucking over it without injury, and continue according to the weather to the 15th of February or the 1st of March. In other years we vary that program by using hardwood ashes. It has been our experience that quite a number of people save up their horse manure in piles two or three years, during which time they turn it over several times, with the expectation of selling it to the park department. We do not accept any manure which is not thoroughly rotted, is at least two years old and has been turned over twice. We have purchased this season in the neighborhood of six thousand cubic yards, the truck measured as it is delivered, and paid the uniform rate of sixty-two and one-half cents per cubic yard. On our beds and plants and flowers as well as for newly planted trees and shrubbery, we use an artificial fertilizer containing about 10 per cent. of ammonia, 4 per cent. of actual potash, 4 per cent. of available phosphoric acid. Of this we use from fifteen to sixty tons. This we start in using at the beginning of April and use throughout the season. We also use from one to five tons of Peruvian guano in our flower gardens beginning in June and using the same throughout the season.

Our park system of some eighteen hundred acres consists very largely of lawns, nearly all of which are open to the public during the entire season, and the wear and tear, especially on the meadows of Prospect Park, is very great, as we often have from fifty to sixty thousand in the park at one time. We find, however, that by interchanging the use of old horse manure and unleached wood ashes, we get excellent results, our lawns being equal, if not superior, to any private grounds in this vicinity.

The use of fresh horse manure or street sweepings on lawns is, of course, precluded. We have, however, used fresh horse manure on new work when we could get it delivered free, having spread the manure on loosened subsoil, then covered it with from twelve to fifteen inches of good garden mould and plowed repeatedly and harrowed.

We have formerly had our own compost heap in a depression of one of the unimproved parks, where we stored from two to three thousand loads of that article, letting it rot and frequently watering it and turning it over for two or three years, when it was ready for use. This idea, however, had to be abandoned about one year ago, as all the then available park space was improved and cultivated.

Brooklyn, N. Y.

W. J. ZARTMAN,
Superintendent of Parks.

We use now exclusively composted manure as a fertilizer. I obtain the same from our fire or police department stables. It is delivered to us free to any place we may designate within a reasonable distance from the police stables or the various engine houses; besides the above, we get the so-called horse droppings from the permanent pavements. We get in these various ways about 2,000 cubic yards of fertilizing materials, which I consider very good and prefer it to the other prepared fertilizers. We, as a rule, pile up the materia^l

in heaps of about 150 cubic yards. When ready for use, turn the same over three times and mix in a small percentage of slaked lime. Inside of a year the compost, if properly handled, is free from almost any seed which could possibly germinate, therefore, there is no danger of bringing weeds into your lawns.

New Haven, Conn.

GUSTAVE X. AMRHYN.

Superintendent of Parks.

I favor well-rotted manure thoroughly forked into the loam for new lawns. For grassed lawns and shrubbery beds of small extent there is probably nothing better than Colorado sheep manure applied about the first of April at the rate of 1,200 lbs. per acre for the lawns, and twice as much for the shrubbery beds. As a surface fertilizer for lawns later in the season, unleached hardwood ashes and bone meal, three parts of the former to one of the latter, one ton in all per acre, is recommended. If mixed, they should be allowed to heat before being applied. There is no need, on the score of either economy or value, in spreading barn yard or stable manure on lawns, especially near dwellings. Sheep manure would be much more used if its value as a fertilizer was fully appreciated.

EDWARD P. ADAMS.

Medford, Mass.

The proper application of the proper kind of fertilizer at the proper time is a great question.

I think that perhaps the nature of the soil, its degree of elevation and contour, govern one to quite an extent in the fertilizers we use. If the situation is low and the soil is of a heavy clayey nature, I would use sweepings from the asphalt, and the more sand in it the better, either in making or for dressing the lawn.

If the soil is of carbonaceous or muck nature, perhaps good sharp sand would be the best fertilizer.

On land that is leachy and porous, I would plow in decaying leaves, rakings, stable manure, or any such material as would supply in decomposition the necessary carbon and have a tendency to hold moisture. In dressing this kind of a soil I think wood ashes is the very best fertilizer that can be used, as it contains within itself, all the elements necessary for vegetable growth in good proportion, and it also attracts moisture from the atmosphere and retains it until called for by the roots.

A lawn well dusted with good ashes will withstand a drought better than any other fertilizer, and is almost as good as ground land-plaster for that purpose.

We have used thousands of loads of sweepings from the pavement and consider it a first-class material as it furnishes nitrogen and carbon, also results in the necessary humus, spreading it during winter and taking off the refuse in spring cleaning.

In spreading wood ashes perhaps the spring is the best time when the ground is open, as it works down a little and cannot be washed by heavy rains, particularly on slopes to the lowlands which, as a general thing, are rich enough.

Has any one experience in the use of screened coal ashes, and if so, with what results? Are they good for gravelly soil, and do they afford much nourishment for vegetation or resist the attraction by the sun of moisture from the earth?

Bridgeport, Conn.

CHAS E. KEITH,
Superintendent of Parks.

We have had very little experience with the different fertilizers, therefore I cannot contribute much to the information contained in this Bulletin. Up to two years ago we used stock-yards manure for fertilizing our lawns, manure which had been piled up in the yards for years and thoroughly decomposed, a most excellent material, but quite offensive in odor in the spring, and as the population about the parks increased, its offensiveness prohibited its use, therefore, we had to resort to other things. We have used ground bone for the past two years with good results. We are now making arrangements to compost street sweepings.

Chicago, Ill.

J. F. FOSTER,
Superintendent South Parks.

The subject of fertilizers is one that cannot be disposed of in a paper of the size suitable for our Bulletin. So many conditions enter into the question of their use, that, to employ them intelligently, it were better to call in the aid of the scientist; and this can be done without cost, through the mediums of the bulletins of the U. S. Government Experimental Stations. By these bulletins, we are told that the principal elements of plant food are nitrogen, phosphoric acid and potash; that the nitrogen enters largely into the production of leaf structure, phosphoric acid builds up fruit and seed, while potash produces woody fibre. Seeing this, it would seem essential first, to know what the soil contains, secondly to know what the crops to be grown require. These conditions and necessities having been ascertained, it is evident that the composition of a fertilizer can be estimated which will meet the requirements of a certain crop, on a certain piece of land. The lack of knowledge on these questions, undoubtedly is responsible for a great waste of time and money among the cultivators of land.

Now, while park superintendents, as a rule, are not competent to analyze a piece of soil, yet they can have it done at comparatively slight cost; and the first step has been accomplished. The government will furnish free, crop requirements; the composition of a fertilizer should then be an easy matter.

We have used commercial fertilizers with great success. Our crops being trees and shrubs, we use a fertilizer containing a large proportion of phosphoric acid and potash and a little nitrogen, the formula being nitrogen 3 per cent., phosphoric acid 8 per cent., potash 12 per cent. We use all the manure produced by our fifty horses, principally on account of its value as a maker of humus in the soil, conserving moisture and giving greater availability to the commercial fertilizers when applied.

We find it cheaper and better to shake the manure and saturated

bedding from the drier bedding and apply it at once to the soil. Thus, we save extra cartage and the labor of turning it over in the storage yard; and we save, besides, about one-third of its value, according to the best authorities. We find its greatest value, probably in its application as a mulch to plantations of young trees.

For lawns alone, we use no fertilizer; usually the grass grows strongly enough, provided the clippings are not cleaned off. This effects a saving of labor in mowing.

J. A. PETTIGREW,

Boston, Mass.

Superintendent of Parks.

The question of fertilization, or the feeding of plants, is one which it seems to me, our knowledge of, is, at present, very imperfect. I believe we are on the eve of a better knowledge of what the plant eats, how it is digested and how assimilated, and that this knowledge, when brought into practical form, will revolutionize our present method of fertilization. Historically, the first manures were those of organic or animal origin, which by decomposition, became the food of plants. Then, about 1830 took place the experiments of Laws and Gilbert of England, in which they demonstrated the importance of mineral substances in plant growth and instigated the practice of having fertilizers consist of the mineral substances found in plants from fourteen to twenty in number. At this time, there was placed on the market what was called "complete fertilizers" of which those compounded by the "Mapes formula" were probably as good as any, and the ads. in those days stated that the fertilizer contained all the mineral elements found in the plants they were designed for, and in the same proportion in which the plants used them.

At that time this was the most advanced theory of fertilizing known. In 1872, Professor Levi Stockbridge began his experiments, which resulted in the "Stockbridge formulas," which were in substance that all the mineral elements necessary for plant growth were found in abundance in the soil, except potash, phosphoric acid and nitrogen, and that the fertilizer which furnished these three elements furnished all that was lacking in the soil, and this is the basis of all commercial fertilizers at the present time, but in 1888, bacteria was discovered and about five years ago, the experiments relating to the influence of bacteria on plant growth were begun, which has in part resulted, and probably will completely demonstrate the fact that the bacteria life in soil acts as the digestive agent for the plant food in a similar manner as the secretive fluids of our own body digest the food which we eat.

It has already been demonstrated that there is a special bacteria which does this work for clover and the other leguminous plants. It has also been shown that another bacteria is especially adapted for the digestion of the food for corn, although it has not yet been separated as has the one for clover. The principle seems to be very well established that no plant of the higher orders can digest, absorb and assimilate its food from partly organic matter, but depends upon the action of the lower organism such as bacteria to prepare it for them,

and it will probably be found a truism that if we feed the bacteria, the bacteria will feed the plant, and the plant will feed us.

The experiments along this line are quite well advanced in Germany and are attracting a great deal of attention from the experts at Washington. It may be several years before we have fertilizers especially adapted for the introduction of special species of bacteria, or for the growth of the bacteria already in the soil, but undoubtedly the time will come when such fertilizers will be on the market and the methods of propagating and manipulating them will be known to all who are interested in the growth of plants. We are on the eve of a revolution in fertilizers, and the knowledge which is about to come to us will render our present knowledge antiquated. The fertilizers which are now provided for general use and commonly known as commercial fertilizers are composed of such substances as permit the growth of plants by the exhaustion of the soil; that is, the principle under which commercial fertilizers are manufactured is to supply those alkaline salts whose action in plant growth is similar to that of reagents in chemical operations. The increased supply of these salts enables the plant to take a greater quantity of plant food from the soil, and often in excess of that which is naturally produced by the bacteria of the soil. This, enabling the plant to take and assimilate an increased quantity of food, is the fault of the so-called commercial fertilizers which fault should be corrected in so far that the fertilizers should not only furnish the alkaline salts needed as reagents, but also furnish the food and stimulus for the bacteria already in the soil to live on and also introduce new kinds of bacteria of that species which may produce the particular food needed by the different plants.

G. A. PARKER,

Hartford, Conn.

Superintendent of Parks.

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Street Trees

This Association, with profit to the community, could give its attention, and throw the weight of what influence it may have to the question of planting and maintaining street trees. There is a woeful lack of interest in the subject, considering its importance to civic beauty. In fact, the subject seems to command less attention than it did in years gone by; else New England's cities and towns would not be noted far and wide for their fine old trees. This reputation, a legacy from the past—the forethought of the ancestors of the present generation—will soon fade, unless public spirit is aroused to the necessity of arresting the decay, and taking measures to promote growth and vigor in such trees as may yet be benefited, also in re-planting where lack of care and even criminal destructiveness have made gaps in the ranks.

At the present time little or no thought is given by city and town governments to the matter of street planting. Not only is the planting of old streets neglected, but newly planned streets generally are not provided with planting spaces. Improvement societies and organizations of like character are forming in many places in the effort to supply this deficiency and make our cities and towns beautiful. Usually, however, a lack of horticultural knowledge prevails among these organizations, and their work is liable to fall into incompetent hands and not give satisfactory results.

This association can be helpful, as occasion offers, by giving of its practical knowledge in the education of the people as to trees and their requirements. The lesson is simple enough. Its salient points may be summed up as follows:—A good foundation for growth, by providing a good bed of loam for the roots; a healthy young tree, nursery grown, of not more than one and one-half inches in diameter, for planting; a stout box guard for protection from vandal hands or stray horses; a little pruning, if necessary, to maintain symmetry of proportion or to encourage a leader; mulching and watering in dry seasons for a few years after planting; a regular system of fertilization; and protection from insect pests. Nothing adds more to the beauty of a street than healthy trees, well cared for; and nothing adds more to the comfort of the dwellers therein than the pleasant shade they afford.

J. A. PETTIGREW,
Supt. of Parks.

Boston, Mass., 1903.

It seems that the love of tree planting is diminishing, and we will soon have no trees in our city streets. There is no reason why streets should be treeless if the proper precautions are taken, and suitable spaces filled with good loam and planted with good healthy trees, prepared beforehand in suitable nurseries where they can have plenty of room to develop and be trained for street decoration, what has been done in other cities certainly should be done in our own. We are too careless about these things. We let everybody destroy them, telegraph men, wire men of all descriptions, careless teamsters, who hitch their horses to unprotected trees when in a few minutes the growth of years is ruined. We cannot put these things in language strong enough. It is a shame and disgrace that our trees are treated as they are. There ought to be a law making it a criminal

offense for any one to injure a tree on a public highway, and until some such law is enacted and carried out, we cannot have our trees protected as they should be.

JACKSON DAWSON,
Superintendent,
Arnold Arboretum.

Boston, Mass., 1903.

I would like to know the northern limit for growing the catalpa without its being killed by frost. We are near the line here, I think. We have ten fine ones, planted eleven years ago, and one or more of them has a struggle in the spring and will be three or four weeks later than the others in leafing out. We had one last season that blossomed a month later than the others. They flourish best in peat. The roots are large and fleshy, and need quite a lot of moisture. We have five planted in the edge of a reclaimed swamp where the water does not stand long on the roots; in this soil they make two or three feet growth in a year. I would advise using equal parts loam and peat in planting, if the peat can be procured without too much expense. I think there is no more ornamental tree grown; when in full bloom it is perfection.

I am much interested in what Mr. Pettigrew has to say about shade trees. I can get no one here to take any interest in the matter. The lineman has full swing in his butchering of the trees we have.

W. H. RICHARDSON,
Supt. of Parks.

Concord, N. H., 1902.

TREES AND THEIR ENEMIES.

(Read by J. A. Pettigrew, Superintendent of Parks, Boston, Mass., before Gardeners' and Florists' Club, 1903.)

The intent of this paper is to call the attention and earnest consideration of the members of this club to the many enemies with which the trees in our streets have to contend.

It is well for our comfort and enjoyment that Nature has imparted strength and endurance to so much that is beautiful. For were it not so, our residential streets would be simply burning, glaring surfaces, confined by bare walls of brick and stone; such, for instance, as Beacon, Marlboro, and other streets in the Back Bay district. Contrast with these streets such tree-clothed streets as Melville Avenue, Dorchester; and K street, South Boston. One of these streets is unpretentious in the architecture of its houses, yet the softening influence of the trees adds a beauty that architecture alone cannot give; and, too, what a sense of hospitality and comfort their shade engenders in the mind.

Trees may be ranked among the noblest products of Nature. By many they are so valued: but there are others—careless, unthinking, or ignorant—who may be classed among the enemies of trees; for the enemies of trees, sad to say, are not confined to insects or lower organisms; the greatest mutilation of street trees is done by the hand or through the negligence of man.

An examination of the trees in the streets of Boston, will show that one-half are injured by the gnawing of horses; one-third are injured, in addition, by the employes of corporations in stringing wires for lighting or other purposes. Others, again, are injured by contractors employed on various works in the streets or adjoining property—a contractor or a lineman seldom hesitates to use a convenient tree as a guy post, yet a tree cannot be so used without injury to it. Municipal employees, themselves, are generally without instruction to

care for street trees, and, therefore, are careless of their well being—in fact, will cut half the roots or branches from a tree unnecessarily, and without thought or compunction.

The greater part of this destruction is caused by lack of knowledge or appreciation, on the part of employers of labor and of public officers, of the value of trees to a city. Of laws, there are enough on the statute books, I have no doubt, if enforced, to protect the trees from despoilment. Of what use are dead laws? The remedy for the evil is in their enforcement. Protection would be a simple matter were the public instructed to arrest wanton or careless destroyers of trees. This in itself would be an education. Trees would have additional value in the eyes of the masses were an interest displayed by public officials in their protection and care.

But what shall we say of those who, while not enemies of trees, do not plant trees, even when opportunity offers? As witness, the streets before mentioned—Beacon, Marlboro, Newbury and other streets in the Back Bay. It has often been a source of wonder to me how so many cultured people could seemingly be of one mind in the exclusion almost of trees from these streets, resulting as it does in such inhospitable barrenness. To pass through these streets in summer one ceases to wonder that the houses on either side are deserted: in the fitness of things it seems proper that from such conditions people should flee, seeking the shade and comfort denied them at home because of their own careless neglect of the advantages they might secure by planting trees in their streets. It may be, however, the summer hegira from the aristocratic districts has something to do with the lack of tree planting; not being present during the heat of summer, the great need of shade is not felt; yet it is not only in summer that trees are effective: in spring the swelling buds give an added charm to the delicate spray-like effect of the branches that are so beautiful in winter; while at all seasons trees end a softness to hard architectural lines. Under competent management, there is no reason why these streets should not be embowered with trees, and thus relieve the Back Bay district from its monotonous appearance.

Another, and an insidious, because unconscious, enemy of trees is one who would compel them to live under crowded conditions, who would not cut out or permit others to cut out a tree even though it were injuring or killing its neighbor. Greater injury to trees in Boston's streets and lanes has been wrought from this cause than from any other. This tree enemy is everywhere prevalent, and is largely responsible for much tree mutilation and destruction. Every city, nay every street, every park, and every lane can point its victims. This enemy, as I said, is insidious and hard to overcome, because well-intentioned. While striving to prevent trees from having the light and air that Nature demands, this enemy may, perhaps, be one of a board of philanthropists tearing down buildings to make open spaces to bring roses into the cheeks of the children of the tenements.

While speaking of the subject of the crowding of street trees, I would remark that the general tendency is to plant street trees too closely together. It is neither necessary nor desirable to shut out all sunlight from the sidewalk or roadway; occasional glimpses of sunlight are life-giving and add cheerfulness and variety to street life. Sometimes trees are planted thickly in the streets for quick effects, with the intention of after thinning. But this good intention of the planter is seldom carried out. It would be wrong, however, to say that this is not a good plan, because its design is not carried out; for I believe the time to be at hand when the public in general will be sufficiently advanced in horticultural knowledge and in the desire to have its streets adorned with well-grown trees, to take advantage of the best methods of bringing about this result.

That the desire to preserve trees is growing, is proven by the passage of an act by the Legislature of Massachusetts, "To codify and amend the laws relative to the preservation of trees." The statute makes it obligatory upon towns to elect tree wardens, and authorizes them to have the full charge of public shade trees. Under the act the wardens are clothed with authority sufficient for the purpose of properly protecting and planting trees in the public streets and highways. The clause relative to the raising of funds for the above purpose, and for fighting insect pests, is not obligatory in its terms; it simply says, that "towns may annually raise and appropriate such sum of money as they deem necessary to be expended under the direction of the tree wardens." This act is good, and is a step in the right direction. Leaving the raising of the necessary money to carry on the work to chance, as it were, however, rather hampers it in the execution.

As this statute only applies to towns, the trees of Boston are not within its scope of operation. In a measure, Boston recognizes its obligation to the trees on its public streets. The recognition is so slight, however, that the most crude attention only can be given to their wants.

Boston is not parsimonious in its appropriation for public works. Why, then, should it neglect a matter of such importance as the care of its street trees, when their care stands for so much that is beautiful and of advantage to the city? In Washington they do these things better—not but what the work there could be improved upon, yet so much better that Boston's street trees (and streets, too, in consequence) suffer in comparison.

The trouble lies largely in the lack of knowledge, or the lack of attention given to the subject by the governing powers. Were the same intelligent interest taken in the matter of its trees that is given to its public libraries, hospitals, parks, baths, gymnasiums, or playgrounds every street in Boston suitable for the purpose would be planted with trees, and provisions made for their care. Then, instead of the misshapen, sickly, and mutilated trees that we see on every hand, all would be equally beautiful and contributing to the general effect.

I have said nothing about insect enemies, and I will not in this paper specify any except the elm-leaf beetle. It is a pest of the most pernicious kind, and will, without doubt, work great destruction, if not controlled or destroyed. The intelligence and energy of this club cannot be better employed in the interest of Boston's shade trees than by directing both against this destructive insect. It has been successfully combated by the use of arsenate of lead, in solution. This should be sprayed on the foliage as soon as it is expanded. Timely application is valuable, in that poisoned foliage is furnished for the first meal of the hatching larvae. Larvae descending to the base of the tree to pupate can be killed by a strong kerosene emulsion—one to five.

There are many other insect pests, but they can be left for another paper, as I fear I have already prolonged this one beyond the point where danger may be apprehended.

The catalpa has been used throughout this section of the country for a great many years. On the old King's Highway there still remains several old Catalpa bignonioides that must be 60 or 70 years old, seemingly in good health.

Another line just inside the street walk 6 to 8 inches in diameter are admired very much for their abundant bloom, sparse shade and considered to be beneficial to health. In folk lore it is called Indian medicine tree. When planted in too rich soil it sometimes makes more wood than it can ripen, otherwise it is hardy with us.

While cribbing injures and disfigures the greater portion of the street trees, elms in particular, their great recuperative powers

enable them in most cases to overcome it and grow into quite large trees, and we are glad it is so, for in our judgment it is the King of all street trees. The sugar maple has been largely planted, but the white grubs infesting them at the base, or some bruise, destroyed the larger portion hereabout, and they have passed out of favor and Norway maples have taken their places.

The *Gleditschia triacanthus* is an admirable tree, very hardy, of quick growth and of good proportions, but one might object to its thorns, which protects it from being mutilated.

The *Celtis occidentalis* makes a good street tree and will outgrow quite severe bruises, also will stand very severe droughts, and again some birds are fond of its fruits. It is used as much as the elm in the South where it is admired very much. Other species of street trees have been sufficiently enlarged upon. The laying of curb stones cause the mutilation and cutting of the trunk and roots of many large trees, but the ordinances of many cities compel it. The sewer and water pipes may do some damage while being laid, but once in position, any small leak would be beneficial to any roots that come in contact with it; but it is not so with leaky gas pipes. They are destructive to the roots of any vegetation that gets a whiff of them.

I think if councilmen and other committees having control of many of our cities would do less scheming, less deviltry, and less planning for the advancement for themselves, their friends or their party and pay more attention to the great good that trees, in fact, all vegetation does for all animal life, it would be much better for the communities in which they live. Do any of them know and if they know do they stop to consider the great benefit trees have upon the health of the human beings living near them; or the great quantities of carbon and other poisonous matter consumed by a tree; and of the oxygen the life giving element given off of these same trees.

Do they know that the living tree ameliorates the climatic conditions by remaining nearly at the same temperature throughout the year, (about 45 degrees) and that if they would give more attention to the uprearing of the noble trees and the care of them, they would be conferring a blessing upon the dwellers in their cities, and they would be remembered with pleasure by those who follow them, as having done something that was not entirely selfish.

CHAS. E. KEITH,
Supt. of Parks.

Bridgeport, Conn., 1903.

When quite young I became interested in street trees and planted a row of sugar maples by the roadside, on a little farm down in Maine. That is a remarkable row of trees; for, in twenty-eight years, not one of them has attained a diameter of four inches.

These trees when planted were about one inch in diameter and were taken from the thick woods.

Their slow growth shows that something besides light and air is needed to make trees grow, a fact which some people who build streets apparently have not learned, for there are streets in this city in which trees are planted in a two-foot loam space between a concrete sidewalk and the curb. This suggests that planting spaces in a street should be made under the direction of a competent gardener; and I believe that the city forester, tree warden, or park board in charge of street trees should have some authority in deciding, not only how the planting spaces in a street shall be planned and constructed, but in deciding in what street provisions shall be made for tree planting. Their duties should begin before the plans

are drawn, and it should be the duty of street commissioners to consult these experts before deciding how a street should be laid out.

In our Huntington avenue extension, there is a 25-foot loam space, wide enough for two car tracks and a row of trees, but the tracks are so placed that there is no room for trees. Blue Hill avenue has the same arrangement, and, in addition, has a five foot planting space between the walk and curb and on each side of the avenue; but the loam in these spaces is so shallow that the trees are liable to be duplicates of my sugar maples. When Commonwealth Avenue was placed in charge of the park department, a portion of the tree space was found to contain a shallow layer of loam over twelve inches of macadam. These conditions would not exist if the planting spaces in these avenues had been constructed under the direction of a competent gardener.

Columbia Road, which connects the Main and Marine park system, is being constructed in a much more satisfactory manner. The plans were submitted to the Park Commissioners for their approval, with the result, that the planting spaces will have an ample depth of loam. Car tracks have been placed on one side of the car reservation to make room for a row of trees, and, excepting the trolley wires, there will be no overhead wires.

C. E. PUTNAM,
Engineer Park Department.

Boston, Mass., 1903.

We are apt to consider trees as to the influence that part of them has that lives above ground; that is, their beauty, shade, and life giving influence. I admit these influences may be the most potent, but the influence of that part of the tree which is in the ground has a mighty influence in a city's life; for the roots and the processes of growth in the soil keep it sweet and clean and healthy.

They are one of the best drains the soil can have, for in summer every tree pumps barrels of water from the earth and puts it where it does the most good, a vapor in the air. The taking of this water is one of the methods of creating a movement of water through the earth, preventing it from becoming stagnant and unhealthy. This movement of the water, and the living functions of growth, bring air into the soil, providing oxygen for that class of bacteria growth which give a healthy soil for man to live on.

The malarial, unhealthy soils are those which have bacteria, which requires little or no oxygen, therefore, trees are not only an important factor, but the most important means which nature has for keeping the ground sweet and clean for human habitation.

So true is this that I venture the proposition that a city, or a street of a city, whose soil condition is such that a tree cannot exist is unfit for human habitation, and a street whether paved or unpaved, where the earth underneath the pavement, even if asphalted, is so full of gas, sewerage, and filth that a tree will not grow, and where the air in the street is too impure for tree life, and where the sunlight or the want of sunlight, and the heat are such that the trees do not flourish, then that street is unfit for human habitation and is debilitating to everyone who uses it.

In the production of some greenhouse plants, test plants which will quickly wilt if the moisture conditions are not right, are put in amongst them to detect unfavorable conditions to their more important companions. So trees should be planted in all streets, then if they are thrifty we know certain conditions are favorable for human life and if they do not flourish, the conditions are such that they need immediate attention if favorable conditions for human life are to be maintained.

Hartford, Conn.

G. A. PARKER,
Superintendent of Parks.

We have fine shade trees here, mostly elms and rock maple. If they had been planted farther apart or thinned out, they would be in better condition. I think grandpa could have given us points on planting trees. When he laid out a street, trees were planted at once, and we enjoy the results of his wisdom to-day. Most of the trees planted on the streets here in the last few years are poplars. I do not favor planting short-lived trees for shade; plant for the generations to come. Very few people take any interest in trees here, many old trees are dying and it will not be many years before Concord will lose its most beautiful feature.

W. H. RICHARDSON,
Superintendent of Parks.

Concord, N. H., 1903.

THE ASCENT OF SAP IN TREES.

Within the last few years the problem of the ascent of water in trees has entered on a new stage of existence. The researches which have led to this new development, are of such weight, and extent as to establish a new and indisputable method that makes the former methods that have been taught incorrect, and, therefore, of little value, except as ancient history. The two questions to be considered are:

- (1) What is the path of ascending water?
- (2) What are the forces which produce the rise?

The question has gone through various theories (all admirably summarized in Ward's "Timber and some of its Diseases") such as that the water traveled in the vessels by imbibition in the nerves, that the water went up between the wood and the bark, that the water may travel as a vapor, not in the liquid state, and as late as 1863 Balfour held that vessels, cells, and intercellular spaces all transmitted the ascending water. The change in botanical speculation began with those naturalists who concluding that no purely physical cause could account for the facts, involved the help of the living elements in the wood. To Godlewski is due the credit of this notable theory, still held by some students. The newest and most widely accepted theory, however, is that of Dixon and Joly, which is based upon a power of water, in thin threads to resist tensile stress, added to the fact that a tractional force is exerted on the water columns by evaporation from the leaf under the energy of the sun's rays. This theory of sap ascent elaborated by Dixon and Joly, is fully given with descriptions of their experiments in the "Proceedings of the Royal Society," London, Vol. 57, and is reaffirmed in 1900 in "Nature," Vol. 62, published in London. The fact that transpiration is not accelerated by direct sunshine, but even more influence by warm, dry winds, supports the view that the evolution of vapor at the leaf obeys the laws of evaporation from a moist surface and that the inflow of thermal energy, is developed through evaporation, the leaves being the principal agent, proved by careful experiments which have been made by the most scientific botanists of the world. The roots of a tree also absorb the water in the ground very rapidly, and the cause of the death of so many trees on our streets is from the want of moisture that is needed to protect the life of the tree, and the development of its leaves and branches. Unless there is moisture enough to be drawn from the roots, the tree cannot possibly support the leaves, or enable the wounds to heal over made in cutting off the branches, and all trees that are overloaded with branches should be pruned so as to be balanced to the changed condition, from lawn or forest grounds to street locations, where the same moisture cannot be had that is

needed to develop both the wood and the leaves. There should always, therefore, be an open earth space left at the roots of the street tree. The defoliating of the street trees by the Gypsy moth, canker worm and English elm beetle, will most certainly destroy them, if not properly sprayed, and the limbs of the defoliated trees dying at the extreme ends, entails an amount of the most expensive and dangerous pruning in, to save the life of the tree.

The theory that some parasite will come to the aid in the destruction of these destroyers of our beautiful trees, is the most dangerous heresy possible, as the neglect of the immediate destruction of these pests when they first appear by spraying, with arsenate of lead, will save an enormous extra expense entailed by adopting this parasite theory. Even when a parasite is found, the increase of the insect pests is so great, that parasites cannot be produced in numbers enough to meet the enemy.

In conclusion let me repeat that the best time to trim all fruit, and deciduous trees, is in the month of May, and up to the middle of June in New York, and all the New England States, after the leaves and blossoms are formed, and their sap drawing quality is at its best, to heal both bark and wood. An active experience in both orchard and street tree work for over thirty years, with careful experiments has proved that no winter, autumn, or mid-summer pruning should be done, if you wish to get the best results.

I am indebted to *Annals of Botany*, Vol. X, and Prof. Ganong, of Smith College, in the matter of the ascent of sap, and the most exhaustive of experiments made in the laboratory and field by such able botanists as Dixon and Joly has proved this statement to be thoroughly scientific both in theory and practice.

I was induced to write this article so as to inform all members of our Association that there was a scientific reason for pruning trees when the sap of the trees was sure to be of the best quality for healing the wounds made, and the fresh leaves were doing their best work in drawing the sap to the branches.

CHRISTOPHER CLARKE,
Commissioner of Parks.

Northampton, Mass., 1903.

The conditions in our cities are becoming constantly more and more unsuitable for healthy tree growth. The march of progress in our civilization necessitates the cutting up of our street beds for pipes, wires, conduits, etc., to such an extent that root growth under the street pavement is practically cut off. In addition we have the injury to trees from leaking gas pipes, from smoke and soot; the mutilation of branches and trunks from various causes; and the depredations of insects. Yet, in spite of all these disadvantages, we find trees growing in our streets, and even occasionally reaching out into the densely populated tenement districts where the asphalt of the streets meets the brick of the sidewalks. This indicates that nature will meet us more than half way. But we must do our part. Proper beds of soil must be prepared in which to plant; protection must be given from insects, and from what is worse—the mutilation of branches and trunks by the employees of electric light and telephone corporations. Trunks must also be protected from the gnawing of horses; and the most suitable trees for each location must be used, which brings me to the point I had in mind when I commenced these notes.

For street planting we fortunately have an abundance of material from which to draw. The tree that may fairly be said to be the best city tree for hard conditions is the tree of Heaven (*Ailanthus glandulosa*). Even in tenement districts, where it would seem impossible that a drop of water could percolate through the pavement to the roots, we occasionally find this tree reaching up to the second

story windows. I know of no insect that will attack it. Its staminate flowers are reputed to be ill-smelling. This, if necessary, could be remedied by cutting them off.

The silver poplar (*Populus alba*) by many is regarded as an undesirable tree on account of its habit of suckering; yet it has its uses; in poor soils, and under hard usage, it will take a strong and winning fight. It is not suitable for narrow streets because of its wide-branching head.

The white willow (*Salix alba*, variety *cerulea*) also will thrive fairly well under hard street conditions. It is a handsome tree, and though early in leaf, carries its glossy green foliage until late in the season.

No list of street trees would be complete without including the American elm (*Ulmus Americana*); yet it should be carefully located. Given good and fairly moist soil, and plenty of room, no tree will more amply repay in graceful beauty. Its place is in wide streets and avenues, where smoke conditions are not severe. The European elm (*Ulmus campestris*), while not such a graceful tree as the American species, is a valuable tree for the streets. It will accommodate itself to comparatively dry and sterile conditions of soil. It bears hard usage well, and holds its beautiful green foliage until late in the autumn. It is columnar in growth, and suitable for streets of moderate width.

The horse chestnut (*Aesculus hippocastanum*) is a good tree for semi-urban streets where good soil exists. The early maturity of its foliage is compensated for by its early summer beauty of foliage and flower.

The European linden (*Tilia vulgaris*) is a valuable tree for city streets. It requires a good soil, fairly moist, and when established will endure the hardships of street life with considerable success. The tussock moth is its inveterate foe, from which it must be protected, the same may be said of the horse chestnut.

The ginkgo will prove a very valuable tree for street planting, as far north as Massachusetts on the east coast, and ranging across the country through Buffalo, N. Y., Cleveland, Ohio, and Springfield, Illinois. North of these points it is probable that, though the tree might exist, the climatic conditions would be too severe for free growth. Good specimens can be found in Boston, Buffalo, and Cleveland. I have not been able to learn whether outside of Washington, D. C., it has been used for street planting. On Pierce street in Washington it has been used successfully. The trees are about 30 feet high, and the branches intermingle across the narrow street. I had the pleasure of seeing the street two or three years ago. It was in the fall when the leaves had assumed their golden tint, and were fluttering to the pavement. It happened to be night, and under the electric light, the effect was like a scene in fairy land.

The ginkgo seems to have no fungous or insect enemies. Its growth is rapid after it once becomes established. It requires, however, a moderately rich and deep or well-loosened soil. The park department planted a street in Boston three years ago with them, and they are doing well and bid fair to make a fine avenue of trees.

The ginkgo, although a little stiff, is also a handsome tree, and it has an advantage, too, for street purposes, in its lightness of foliage; it does not cast the dense, damp shade of the horse chestnut or the Norway maple.

The Norway maple (*Acer platanoides*) is an excellent tree for wide streets in the less thinly populated parts of cities. It will grow in moderately dry soils, and produces a handsome wide-branching head. It has fine foliage, and is comparatively free from insect depredations.

The red oak (*Quercus rubra*) is a suitable tree for semi-urban conditions. The oaks have been esteemed slow-growing trees; yet,

under similar favorable conditions for growth, the red oak will be found to outstrip the hard maple. It is, however, impatient of asphalt and cement pavements, and should be used only where it can have an open situation.

Scarlet and pin oaks also will do well under similar conditions as indicated for the red oak.

The cottonwood (*Populus monilifera*) is a useful tree for temporary work where quick effect is needed; but it soon becomes too large for use in ordinary streets.

The soft maple (*Acer saccharinum*) is also of too heavy growth for use in narrow streets, and should be used only where the soil is good and where it can have abundance of sun and air. Under such conditions it will grow in beauty and gain strength of fibre sufficient to withstand wind and storm.

Have any of our Associates had experience with the paper mulberry (*Broussonetia papyrifera*) in New England? It is a common street tree in the South, and in Brooklyn, N. Y., I found a few specimens in good health near a chemical factory, the fumes from which had nearly destroyed all trees for some distance beyond the radius of the paper mulberry.

J. A. PETTIGREW,
Superintendent of Parks.

Boston, Mass., 1903.

In this city, all street trees are cared for and controlled by the Parks Board.

When a street is ready for boulevarding and tree planting, it is advertised by the city council as a local improvement, for the usual thirty days. A by-law is then passed by council authorizing the necessary expenditure and authorizing the Parks Board to take over, construct and maintain boulevards and to plant, maintain and control all trees on said boulevards.

The cost of construction and tree planting is assessed against the properties abutting, payment covering a period of seven years. The cost of maintenance is charged annually as a direct tax and is assessed at a rate per front foot.

As all our streets, except business streets, are boulevarded, it will be seen that the board practically controls all street trees in the city. This plan should answer admirably in cases where trees already exist on streets, whether boulevarded or not, as the provisions of the by-law could be drafted to suit each case.

Alnus glutinosa and *A. laciniata* thrive well in low-lying districts where soil is rich and moist. *Fagus ferruginea*, *F. sylvatica*, *F. purpurea* make splendid street trees when planted on a wide boulevard with rich shallow well drained soil. *Juglans nigra* and *Tilia dasystyla* are very desirable trees, but like all the foregoing, will not succeed in a manufacturing city, as pure air is a necessity for these trees, so far as my experience goes.

Celtis occidentalis, *Betula pendula laciniata*, and *Cercis canadensis* could be used to advantage on narrow residential streets where a clean stemmed tree is not a necessity.

The making of a mixed appearance where there are already two or three kinds of trees, by adding one or two more kinds, cannot be worked out satisfactorily if trees are in rows; small groups of each variety would be permissible and with careful selection, make good effects, but only on a very wide boulevard and where the street can be treated in a similar way throughout.

G. CHAMPION,
Parks Superintendent.

Winnipeg Canada, 1908.

In regards to your inquiry concerning the proper regulation and control of city trees, perhaps you are aware our city trees are under the care of a forester, appointed by our park commissioners and under their directions with full power. All expenses paid from an appropriated fund. This year they had to issue bonds as the city appropriations were all fixed before this forestry matter was settled. I think this will be a success if the city will give money enough for the next five years.

In the early spring we had several spraying wagons in action, while the caterpillars were seen, after which trimming and thinning went on. There is trouble sometimes where trees are too close. The property owners don't like to see them cut down, because their grandfather or some other relation planted them.

The great trouble in our cities to-day is too thick planting, every one that has a 30 feet lot must have two trees in front, a considerable deal of ax work has to be done to overcome that. This fall we have planted over 500 young trees in vacant places, mostly American elm and Norway maple, as we have a very hard red clay subsoil. I find the only varieties that do much good are American, Scotch Huntingdon and English elm, and Norway, silver, ash leaf and sugar maple, the latter we plant on some sandy sections. The *Platanus orientalis* does very well and would recommend them for street use. The insects don't trouble them. The catalpa is also good.

The poplar, mostly Carolina, has been very liberally planted in Buffalo, owing to their rapid growth in the clay, but now they want them all cut down because their roots are filling their sewers and in some streets has reached the main sewer and caused great trouble. The Carolina poplar is condemned on that account.

In regard to mixed planting on city-streets, I am greatly opposed to it, we see too much of it every day, nothing looks nicer than a street of the one variety, we have plenty of streets in our city, so we have plenty of opportunity to plant all the different varieties without mixing them up.

Speaking of trees undesirable for street planting there is none more unfit for that purpose than the *Cercis*, they are too dwarfed, too brittle and worst of all, there would be nothing left but the trunk should they ever come in flower.

WILLIAM DONALDSON,
Assistant Superintendent of Parks.

Buffalo, N. Y., 1908.

In my opinion the "*Cercis*" is unsuitable for a street tree under any conditions, for narrow streets in Washington we use trees of a fastigiate habit, the *Ginkgo biloba*, *Quercus robur pyramidalis* and Lombardy poplar type (without wide spreading branches to interfere with traffic). Regarding the desirability of mixed varieties of trees for city street planting, I condemn this practise, trees of one variety, as far as the streets extend, are always to be preferred, where street plantings are already of two or three kinds, in adding another species you simply make matters worse.

GEO. H. BROWN.

Washington, D. C., Nov. 1908.

As to the use of *Cercis* for street trees, we do not think it would be practical in our section of the country. In adverse locations they are not quite hardy, they are of too straggling a growth, and too apt to split at the crotches. On a private place, or narrow street, where a mixed row of odd or mixed low trees are desired, perhaps

one could combine with good effect the Cercis with the following: Amelanchier, Cytissus, Psetia, Crataegus or the Cornuses. But I think they would look much better grouped by themselves on some side hill or a little distant from the street or driveway. In the south I saw many rows of Celtis used for street trees with very good effect. But none up this way. Very large numbers of Populus monilifera, 10 feet apart, are used about here on private places and streets, with very good effect.

CHAS. E. KEITH,
Superintendent of Parks,
Hello. Hello.

Bridgeport, Conn., Nov. 1908.

My experience with Cercis leads me to think it quite unsuitable for street planting. There are a large number of specimens in the National Zoological Park, both indigenous and planted. It is only valuable for a few weeks in spring when in bloom. After that it is an unsightly leggy tree, rather a blot than an ornament.

FRANK BAKER,
Superintendent National Zoological Park.
Washington, D. C., Nov. 1908.

As to street trees, all trees on city streets have been put under the care of the Park Department by an act of Legislature of 1904. This act provides for the formulation of rules and regulations by the park board. A copy of these rules and also regulations for planting trees are enclosed. Permits are issued by the Superintendent of Parks for the pruning, spraying and cleaning of good trees and for the removal of dead and dangerous ones after investigation of the trees affected, by competent employees.

The department has for the last two years been engaged in the systematic treatment of street trees in certain districts of the city and about 30,000 trees have so far been looked after. As there are over 200,000 trees under our jurisdiction it will take some years to complete our task.

Here is a list of little used trees on city streets:

1. Ginkgo, admirably adapted for narrow residence streets, can be planted in any soil, and is singularly free from insects and disease.
2. Red Oak, quickest grower of the oaks, hardy.
3. Scarlet and Chestnut Oaks, hardy; fairly rich soil.
4. Tulip, fairly rich soil, hardy; free from disease and insects.
5. Sweet Gum, rich moist soil.
6. Pistillate Ailanthus, will grow on poor soil and will withstand smoke and dust; free from insects and disease; becomes dangerous when old.
7. Hackberry, use for shade tree purposes in the Middle West; easily transplanted; requires fairly rich soil.
8. Mulberry, very hardy and fairly free from insects and disease in this city.
9. Beech, when once established and properly trained and trimmed it is hardy and free from insects and disease.

The Cercis or Judas tree is not suitable for tree planting because of the low habits of the tree, and its flowers, which would be a temptation to the young.

Mixed planting on city streets is not advisable. A mixture of species will prevent uniformity. Some trees on the same streets will

retain their leaves while others have dropped them; some will grow low while others will grow high. The only justification for mixed planting would probably be where short-lived trees like poplars, are used as nurse trees for hardier species like the Norway maples, which might be planted alternately with the poplars with the idea of cutting out the poplars after the Norway maples have had their start.

W. J. ZARTMAN,
Superintendent of Parks.

Brooklyn, N. Y., Dec. 1908.

PLANTING PERMIT.

Permission is hereby granted to
to plant as follows
.....
upon the following express conditions, to which the applicant agrees:

1. The tree to be at least $2\frac{1}{2}$ inches in diameter, one foot from ground.
2. To be straight, to have a compact fibrous root system and a well balanced head.
3. The trunk of the tree to be free from branches to a height of at least seven feet from the ground and the first branch to be not over nine feet from the ground.
4. The tree to be free from disease and injurious insect pests.
5. The tree hole to be not less than three feet square and three feet deep.
6. One to three cubic yards of good mould to be placed in each tree hole, according to the conditions governing the location.
7. The tree to be planted at the same depth that it stood before transplanting.
8. Wherever possible, trees should be planted not less than twenty-five feet apart. Thirty feet is preferable.
9. The tree to be watered, and surface soil raked or cultivated at least once a week, in dry weather by the owner of the premises in front of which it is planted and otherwise to be properly cared for by the owner of the said premises, at his own expense, and to the satisfaction of the department of parks.
10. The work of planting to be done under the direction and to the satisfaction of the department of parks or its proper representatives, and subject to the rules, regulations and ordinances of the department of parks.
11. A tree guard of approved pattern, or wire guard of small mesh, to be placed around the tree by the owner of the premises.
12. The most desirable trees for general street planting are the Norway maple and oriental sycamore. For species consult this department. The poplar, silver maple and sycamore maple are not desirable for street planting.

I should like to ask why it is that such of you as have charge of avenue or street trees and their planting do not use more *Quercus palustris* or pin oak, instead of all maples?

I realize that it is generally considered that all members of the oak family are slow growers as compared to the maples.

My experience, however, in the case of the pin oak does not agree with this idea. During the past five or six years, I have made more or less of a study of this tree, planting and growing it on my own grounds as well as those owned by others, and I now have

specimens that are nearly as tall as maples, of the same age, while the diameter of the spread of their branches, (or we may say shade) is nearly fifty per cent. more and this on very poor soil, too. The good features of this tree are many; beautiful, heavy, dark green foliage, changing to fine reds in autumn, a clean straight trunk,



branches spreading and drooping a little below the horizontal, growth quite rapid and permanent, few insect enemies, and a tree of long life with only one possible objection, as far as I can see, and that is that it retains its leaves for some time after they turn brown. What could be more beautiful than an avenue of these stately trees, combining, as they do, so many good points.

I would use them, not with the idea of detracting in any way from the well deserved merits of the maples, but to give diversity and added beauty at the same time. Beauty that is not confined to any particular season of the year, as is the case of so many of our trees which are apt to grow dusty and dingy as the hot weather advances, but the same dark glossy green (apparently heedless of dirt and dust) changing to its brilliant reds and rich browns of autumn.

There are, of course, many other desirable street and avenue trees which should be planted more freely than at present, our native beech, *Fagus ferruginea*, for example. But let us use more varieties not all mixed up helter-skelter, but by streets, giving to each so far as possible, that location and surroundings that suit it best.

HEBER BISHOP CLEWLEY.

Boston, Mass., Jan. 1901.

The cut illustrated here was made two years ago and painted with coal tar. The tree is one of the young red oaks on the Boston parkway. A number of similar sections were examined both by

Dr. Metcalf, Plant Pathologist of the Bureau of Forestry, at Washington, and by Professor Whetzel, of Cornell University.

The question asked, was this, Is the discolored wood underneath the cut rotting or is it simply dead wood and still perfectly sound? Two smaller areas on the branch illustrated are darker and softer and are certainly decaying, showing where infection got in from some earlier, unpainted breaks, the colored wood under the cut is still firm to the knife, but the question was, will it always be firm and sound or is it only a matter of time when the discoloration will

increase and the wood decay and the decay spread to other parts of the tree.

The two examinations were made independently, but both gave the same results. Except in two or three cases, quite plainly due to imperfect painting, the discolored wood in all the cuts examined was not decaying and did not contain any rot germs. The wood was dead, but still sound and the discoloration was attributed mainly to the sudden stopping of the sap flow through tissues that were growing vigorously and accustomed to the abundant passage of sap into the limb that was cut off. It was also suggested that the tar may have penetrated the wood somewhat and helped to discolor it.

In my opinion the important conclusions are these. Although the wood may not become decayed if the work is properly done, still I would say cut as little as possible, and as small as possible, and paint thoroughly with any paint that will stick to wood. In the pruning of avenue trees the lower limbs should be removed as fast as is consistent with the proper thickening and strengthening of the bole. I don't like to expose cuts more than 4 inches in diameter. Paint thoroughly and at the next year's pruning paint again.

Boston, Mass, 1909.

R. W. CURTIS,
Asst. Supt, Arnold Arboretum.

It may interest the members, as it did me, to learn of the wonderful vitality and recuperative powers of tree growth.

We have recently suffered from the disastrous effects of an ice storm on this reservation. The ice on the telephone wires measured $3\frac{3}{4}$ inches in diameter, and trees and shrubs were covered in like proportion. While, of course, the damage was very great, yet it was not so disastrous as I at first pictured it upon viewing the scene. The road to the summit was utterly impassable, the trees having bent low over the road and the tops being frozen into the ground ice. I did nothing towards clearing the road, thinking possibly a warm rain or sunshine would release the branches, and they would assume their normal appearance, but as a week went by with no rain or warm sunshine, I lost hope of their ever springing back again. However, after eight days a warm rain favored us, and I got out a force of men to go along and assist Nature by chopping the ground ice and releasing the tree tops and doing what they could to help matters, and I was surprised to see how surely, though slowly, the trees regained the upright position. I lost only those trees that were broken off or uprooted. The reservation will never recover from the damage done in the interior where the growth is heavier, but I learned that it is best not to be too hasty with the axe where trees are merely bent over, regardless of the weight of ice, or of how long they have been frozen into the ground.

It is needless, among those who are instructed in tree growth, to dwell on the unsurpassed beauty of the scene.

I agree with Mr. John C. Olmsted, in the propriety of having park guards or keepers in preference to police.

GUY H. CHASE,
Superintendent Wachusett
● Mountain Reservation.

Princeton, Mass., Feb. 1901.

Do not neglect your pruning. All the time, not any time is a good season in which to do it. Do not, if you can help it, permit any dead or dying branches or limbs to remain on the trees to carry rot into the boles. Prune for shape and symmetrical proportions in

the trees; yet, in woodland masses, do not carry too far the symmetry that is essential in a lawn specimen.

In plantations of young trees, prune to a leader and balance the head, cutting out such branches as may spoil the symmetrical proportions of the tree. Much depends upon preparing the foundation for good form while the tree is young. In the training of a young tree, should shortening back of strong growing shoots be considered necessary, it should not be done later than July, as growth might be started that would not have time to ripen before frost. The shortening of the current year's growth should, however, be avoided if possible. The young growth is very apt to decay at the point of cutting and follow down the shoot in spite of paint or tar painting, and not only spoil your expectation for a leader, but may lead to the ruin of the tree. In young promising trees I have found decay, from the above cause, to run down the pithy center for several feet, and spread out, here and there, into the hard wood.

J. A. PETTIGREW.
Supt. of Parks.

Boston, Mass., Jan. 1909.

We have had to take down a grove of chestnut trees that were killed by the chestnut tree bark disease. An unusual grove for this section of the country, most of them would caliper 2 to 3 feet near ground and were some 75 to 85 feet in height. Nothing has hurt our feelings so much in years as the loss of these fine old trees. They had grown near a river in calcareous soil, bordering gravely upland and stood from 3 to 15 feet apart; perhaps the severe droughts during summer and fall of the last two years had something to do with it, by weakening their vitality and making them more susceptible for the introduction of the accursed spore as they were wafted by the winds or transported to them by bird or insect life.

I find that some of those close to the river that have some roots in water all the time are not affected as yet. Also that the many large individual trees that stand out in the open, with plenty of root room are as far as can be discovered up to the present time in good health. May they continue so.

With the loss of our chestnut trees and the threatened invasion of another pest feared by the leading foresters, that will denude the land of our dear old oak family, will give all tree lovers a heart-ache and cause them to wonder what has come over Dame Nature to allow this denudation to go on and pray her to get busy and put a stop to it.

May she (Dame Nature) induce the National and State Foresters, and Entomologists to give that portion of their anatomy which comes in contact with an easy chair, a rest and get a move on and do something to earn the money that is paid them. Let them ascertain and describe the disease and pests as they come on, so that we common plebians can know them, and take steps to overcome them.

The several years that this chestnut tree bark disease has been spreading, the only advice we have received is "The spore of this fungoid growth enters through wounds in the upper portion of trees and kills it; when discovered, cut down and burn, particularly the bark." We will stop here.

CHAS. E. KEITH,
Supt. of Parks.

Bridgeport, Conn., Feb. 1910.

THE SUPPRESSION OF INSECT PESTS.

We are all a little too apt to think that every one does those things that are commonplace to us, and so, go groping, for things

farther away. This striving for things beyond is all right, but do not be too prone to believe that what is commonplace to us, is commonplace to all. In a recent bulletin some of our members thought a certain subject had been thoroughly treated in previous bulletins. As applied to certain of us under other conditions the subject had not been touched at all. This merely shows how our local conditions throw different lights on the same subject. Do not then thing the subjects in our bunetins too commonplace for use or help to others.

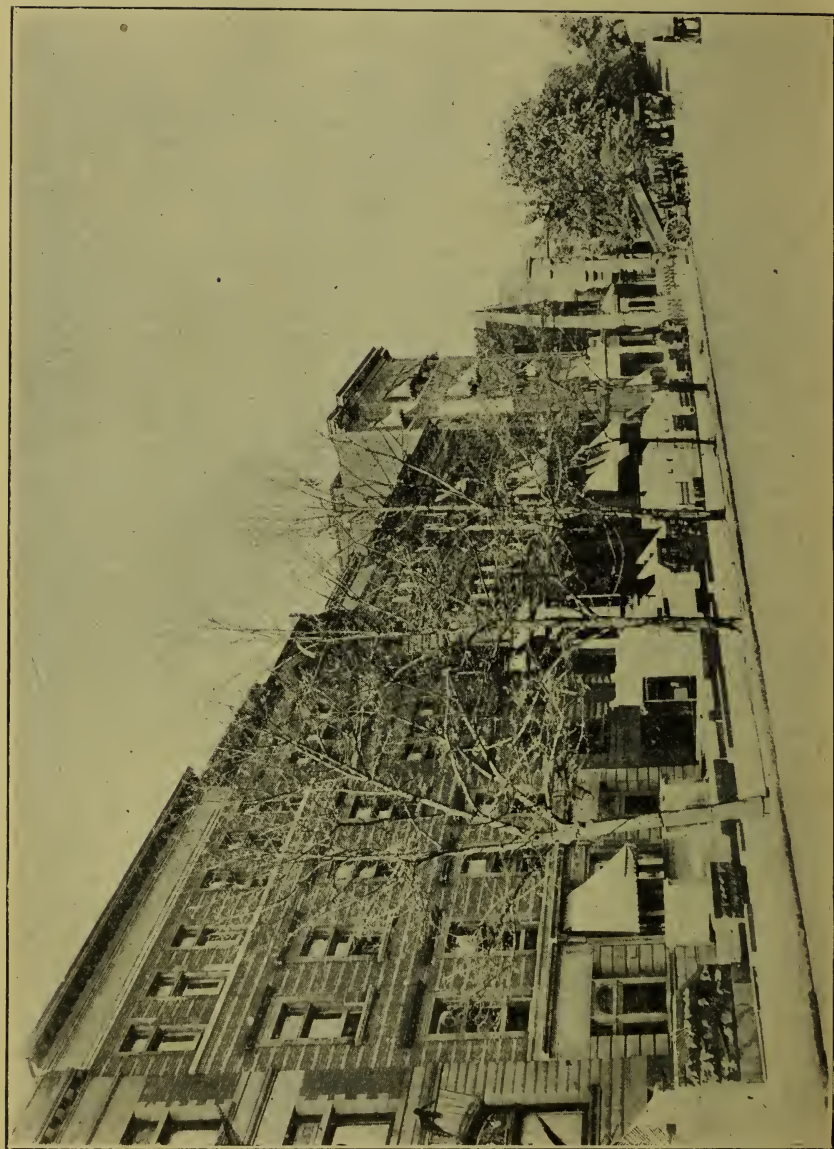
The words brown tail moth and gypsy moth, strike dread and terror, even greater than that which the words San Jose scale, used to do, to those of us who have yet to make their acquaintance. The words San Jose scale, simply mean to some of us now, get busy and be thorough. We have had some of it, but fortunately so far only a little. As soon as we discovered it we began to spray. We also had a white scale on our mountain asn, and the oyster shell bark louse on several things, especially *Cornus alba*. We decided on a Niagara gas sprayer to begin with. This has proven very satisfactory. One tube of gas will spray from five to seven, one hundred gallon tanks of mixture, depending on the experience of the operator. It always seems to take a little more gas when we begin again, even with the old operators, than after we are under way. The tubes we use contain fifty pounds of gas, and cost us delivered a fraction under five cents per pound. Under our conditions, ten tanks of liquid a day, with two or three men besides the driver, depending on the amount of climbing or dodging among the shrubbery, is an exceptionally big days work. We lose time going for material, that had we spraying sufficient to warrant, we could overcome by a helping team, but it would not pay us under present conditions.

For insecticide we were at a loss what to use. Our local entomologist declared lime, sulphur, and salt was the only thing, but there was so much acrimony in his denunciations of other materials, that I could not but feel he was actuated by other reasons than purely scientific ones. I then consulted other entomologists, in whom I had confidence, and was encouraged to try some of the prepared oil solutions. My reasons for preferring oil, if effective, were, first, the trouble of preparing the lime and sulphur solution, which under our spreading system would become an almost impossibility; second, in case of using near buildings, as is often a necessity with us, the discoloration by the lime, sulphur, and salt, would make it almost prohibitive.

The first year we tried "Scalecide," using it in March at the rate of five gallons to one hundred gallons of water. It proved very satisfactory, apparently doing effective work on the San Jose scale, and the white scale on the Mountain Ash. In late May, when the young oyster shell bark lice began to run, we sprayed again, with a three per cent. solution. I had my fears as to what the effect might be on the foliage, but after three days, no injurious effect was discernable. *Cornus alba* was chiefly treated. The lice were checked, but not as completely as the other pests had been. In November, and again in March, treatments were given, with five per cent. solutions. Contrary to expectations, the oyster shell bark louse as well as the other pests were largely exterminated by these winter sprayings. In fact, these sprayings were so effective that the last June spraying was omitted. We use the finest spray possible, with our vermorel nozzles. On our young plantations, we can reach everything from the tower of our wagon. With large trees we have to do more or less climbing.

F. L. MULFORD,
Superintendent of Parks.

Harrisburg, Pa., 1908.



Defoliation of Lindens by the Tussock Moth Caterpillars.

CHEWING INSECTS

Of the leaf feeding insect in Brooklyn, the tussock moth has, as usual, proved the most destructive pest. It seldom appears in large numbers in the suburbs, but in the heart of the city previous to the systematic warfare which was begun against it a year ago, it used to be found very abundantly on almost every shade tree with the exception of the ginkgo the ailanthus and the tulip; and on the lindens and horsechestnuts, its favorite food, it would often be found as thickly clustered as the gypsy and brown tail moths in Massachusetts.

Systematic work against the tussock moth on the street trees was begun in the fall of 1907, while the insect was in its egg state of metamorphosis. During that season as well as all winter and early spring, the conspicuous white egg clusters were scraped from the trees with wire brushes, and then carefully collected and burned. Where the egg masses were situated at the tips of long branches that were too pliable to resist the pressure of the brush, the tips were cut off with pole shears in a manner that would not distort the symmetry of the tree. In other places where the egg-masses could not be reached directly with the brush, the application of crude creosote on a brush or sponge attached to a pole was resorted to. The owners of the adjoining property were asked through the medium of printed cards and by verbal notification to co-operate with the Park Department in cleaning their fences and house walls from egg-masses.

On the 25th of May, just before the first brood of caterpillars emerged, the thousands of trees within the cleaned area were banded with cotton batting in order to furnish traps where the stray caterpillars crawling from other infested objects back upon the cleaned trees, might be gathered in masses and destroyed. The results of this cleaning work, were most encouraging and hardly any of the trees within the cleaned area showed injury from the pest, the following summer. During the coming season, it is intended to try burlap for banding trees, and to extend the use of creosote in destroying egg-masses.

On the 1st of June, when the caterpillars emerged, a number of Niagara spraying machines and barrel-pumps were immediately sent out to spray the trees which had not been previously freed from the egg masses. The spraying material used was arsenate of lead and all efforts were strained to cover as many trees as possible, while the larvae were still young and most susceptible to the poison.

The results from this first spraying were not entirely satisfactory, though the work was carefully conducted and the method correct. There was nothing else to blame, but the quality of the chemical. A series of chemical and field tests were, therefore, started with the arsenate of lead, then in use, and with most of the other important brands purchased in the open market; and some very important facts were soon revealed, regarding the worthlessness of some of the poisons, that were thought genuine and the superior quality of others. All subsequent purchases of lead were then based upon the observations, and the results that followed were very encouraging. A record of these chemical tests can be found in bulletin No. 214, recently issued by the New Jersey Agricultural Experiment Station, at New Brunswick, N. J.

Many other species of caterpillars which spend the winter in a bag or cocoon, such as those of the *Cecropia*, Moth, the *Cynthia* on the ailanthus and the bag or basket worms, were also systematically collected and burned during the dormant season. Success in eradicating an insect pest depends much on universal co-operation and with this idea in mind the co-operation of the public was invited through the medium of illustrated lectures under the auspices of the Board of Education and civic associations, and wherever the



Removing egg clusters of the Tussock Moth.

opportunity presented itself, it was also pointed out that the services of the school children would be valuable in this connection, if they were taught to recognize and gather the egg-masses and other insect forms within their reach. On several rainy days, a few hours were utilized in informal talks to the men employed in this work. Not only were the fundamental principles of arboriculture presented, but also the work against insect pests, their characteristics, etc., were duly discussed. These talks were copiously illustrated with specimens and colored slides. The gypsy and brown tailmoths, which have as yet never made their appearances in this city, were also fully illustrated so that should either of these species ever invade Brooklyn, the more intelligent of our men might be able to identify them and call attention thereto. The beneficial effects of these meetings have been proven by the better grade of work done by the men, and more intelligent interest manifested by them.

SUCKING INSECTS

The "wooley maple leaf scale" (*Phenacoccus aceris*) on our sugar maples is our worst scale pest. In summer, these scales, covered with cottony white masses, are found on the underside of the leaf. Attempts to exterminate the insect at that stage would be impracticable, because the strong solution necessary to penetrate its waxy coating would be apt to burn the leaves. But after the leaves have fallen, the larvae of the insects migrate and settle on the trunk of the tree and treatment can then be applied with more effectiveness and greater safety to the tree. The affected parts of the trunk and branches which assume the appearance of being whitewashed, are first cleaned with a stiff brush fastened to a ten-foot pole and then washed or sprayed with a solution of one part of kerosene emulsion (standard formula) to eight parts of water.

The oyster shell and scurfy scales are also found in abundance on many of our poplars, silver maples and ash trees. Their eradication on many trees has been accomplished by spraying during the latter part of May with kerosene emulsion mixed at the rate of one part to seven parts of water.

The cottony maple scale is very abundant here every other year, and excellent results have been obtained in our fight against it by brushing the insect off with a stiff broom dipped in kerosene emulsion. It has also been demonstrated that where a forcible stream of water can be squirted on, many of the insects may be knocked off by it.

BORING INSECTS.

The majority of the boring insects in this locality, such as the leopard moth larvae and the sugar maple borer, have been eradicated by the injection of a small quantity of carbon bisulphid (CS_2) into the burrow with a metallic syringe and then clogging up the orifice with putty or soap immediately after injection. Wherever this method is applicable, it is preferable to the method of cutting out the insects with a knife or of poking them with a wire, because it takes into consideration the winding course and side galleries formed by the boring insects in the process of feeding. A strong wire inserted in such a cavity can only reach as far as the first bend in the passage. The operator poking along blindly on the outside thinks he has reached the end of the cavity and destroyed everything within, while in reality, the borer may be securely lodged at the other extreme of the winding passage and continue its destructive work undisturbed. The use of the knife on the



Trees banded with cotton batting.

other hand has the disadvantage of causing new wounds which afford easy entrances and places of development for fungus spores. But the carbon bisulphid is a liquid that generates a deadly gas which will expand many times its original volume and penetrate every part of the burrow no matter how winding the passage. The soap or putty will retain this vapor within the cavity until all life is exterminated. The carbon bisulphid is inflammable and precaution should be taken to keep fire from it.

In cases where a beetle is working under the bark or where a gummy substance protrudes from the burrow, the method of injection proved impossible and ordinary hand cutting often became the most practicable method.

There were instances where the borers were so located in the inner wall of a hollow trunk that it became impossible to reach the burrows directly with the syringe. An original method of fumigating the interior of the hollow trunk was therefore resorted to for all such cases and consisted of the following process:

A dish was placed within the hollow trunk and the orifice or orifices leading to it were tightly covered with tar paper. The crevices where the tar paper joins the trunk were closed with putty. A proportional quantity of carbon bisulphid was injected into the dish through a puncture in the tar paper. The puncture was clogged with putty immediately after the injection. The vapor given off by the carbon bisulphid within the hollow trunk expanded and penetrated the numerous borings leading from it. An hour or two later the tar paper cover was removed and an examination of the burrows within the hollow trunk showed that the insects were all dead. The dose of carbon bisulphid to be injected differs with the size of the cavity and can be determined by first calculating the size of the cavity and then injecting the carbon bisulphid at the rate of one ounce to sixty cubic feet of space. This quantity gives an atmosphere composed approximately of one part in ninety parts of carbon bisulphid vapor, which is fatal to all living objects. Carbon bisulphid is a rather heavy vapor and must be allowed to remain some time within the cavity before it will rise and become diffused.

A much lighter vapor that can be used as a substitute for carbon bisulphid is hydrocyanic acid gas which is generated by a combination of potassium cyanide with commercial sulphuric acid and water. This gas requires greater precautions in handling than the carbon bisulphid, and is even more deadly than the latter to all forms of life. The method of application consists in weighing out a very small quantity of potassium cyanide and placing it at the rate of one gram for every cubic foot of space to be fumigated. Then four times as much water and twice as much commercial sulphuric acid as there is cyanide, is poured into an earthen jar and placed at the bottom of the cavity. The cyanide is then dropped into the jar through an orifice in the tar paper and the latter made immediately air-tight. A deadly gas is then generated within the cavity and after allowing it to remain for about two hours the tar paper is removed, and the cavity further prepared for filling.

J. J. LEVISON,

Arboriculturist, Department of Parks.

Brooklyn, N. Y., Jan. 1909.

The gypsy moth caterpillar will attack all fruit, shade and woodland trees. It shows a preference for the apple, white oak, red oak, willow and elm. It will devour on occasion nearly every useful grass, plant, flower, shrub, vine, bush, garden or field crop that grows in Massachusetts.

The caterpillar kills both deciduous and coniferous trees. Woodlands assailed by it in formidable numbers are stripped bare, as in



A cluster of Cynthia Moth Cocoons.
One of these cut open to expose the pupa within.

winter, and many trees are killed. While several consecutive strip-pings are usually necessary to cause the death of a healthy deciduous tree, one thorough stripping will kill the white pine and other coniferous trees.

The eggs of the gypsy moth are laid in July and August in a yellowish hair-covered mass averaging about one and one-half inches long and about three-fourths of an inch wide. During the winter the color often fades to a dingy white. In this mass the average number of eggs are about five hundred. An individual egg is scarcely as large as a pinhead, salmon colored when first laid, but turning dark in the course of a few weeks.

From August to May the egg masses of the gypsy moth may be found in places near which the moth emerged from the pupa case. In laying, the female moth chooses tree trunks, the under sides of limbs, sheltered crotches and holes in the trees, hollow trees, crevices in or under rough bark, etc. The egg clusters are also found on shrubbery, buildings, scattered and heaped rubbish, barrels, boxes and similar objects standing out of doors, wood piles, stone piles, fences, walls, boulders and the like.

The most effective method of destruction against the gypsy moth is to kill the eggs, this can be done by thoroughly soaking them with creosote mixture. The creosote may be applied with a small swab or paint brush. Where trees and shrubbery are extensively infested with the eggs of the gypsy moth, the growth should be cut and burned especially on low-cost woodland and unimproved tracts of brush. The eggs are, however, remarkably resistant to fire, and an intense heat applied directly to the clusters is required to kill them all. Where the clusters are very plentiful the ground should be burnt over with oil to destroy the eggs scattered as a result of the cutting of trees and bushes. This will be required to insure thorough work.

CHARLES A. WHITTET,
Superintendent of Parks.

Lowell, Mass., Nov. 1907.

Cottony maple scale is usually noticed in June and wherever possible, the small limbs infected with them are removed and burned. The tree is also sprayed with a solution of whale oil soap and petroleum. For scale, we spray twice each year, making the solution stronger for winter use. For the later season, we have found lime and sulphur (boiled) very effective. In cases of trees becoming badly affected with borers, we realize that it is often a hopeless task. Crude carbolic acid or bisulphide of carbon injected into the holes by the aid of a squirt gun is effective. Holes should, however, be immediately plugged with putty if results are to be expected. The tussock moth has caused us, probably, more trouble than all other pests combined, and we have been particularly handicapped because of the neglect on the part of citizens at large. It is not uncommon to pass through some of the streets in the larger cities and notice the tussock moth cocoon under clapboards, on fences and even hanging to the mortar of brick walls, and in this city, it has at times, been very aggravating after thoroughly cleaning a park of these pests, to find them again plentiful a few weeks afterwards. I have even seen their larvae making their way across asphalt pavement and no obstacle seemed too great to retard their march to the clean and healthy foliage of the city parks. Under these circumstances, I think it very important that every city should employ a forester and should make appropriations for the care of trees throughout the city as well as for those contained within the park limits.

We have finally made a start here, an appropriation of \$3,500



Fumigating a hollow trunk.

having been made last year for the care of city trees in general by this department, and this we hope to have increased three fold this year.

In fighting these pests, we use torches, burning all cocoons within reach. About the first of June, we spray the trees with a solution of paris green and lime. We also find arsenate of lead effective. In using these sprays, however, care should be taken as the foliage is likely to suffer if the solution is too strong. To prevent the moth from ascending the tree, a belt of tree tanglefoot or other sticky substance applied to the bark with a ladle or stick is resorted to.

H. W. BUSCH,
General Superintendent,
Department of Parks.

Detroit, Mich., Dec. 1907.

The insect we have to fight in this Connecticut River Valley and City of Northampton, is principally the English elm leaf beetle, which has been with us in varying numbers for several years past, being brought in on railroad cars from its original home in Maryland, and has reached Amherst, 7 miles east, and Albany and Troy west of us 75 miles. These elm leaf beetles are quite small in size, resembling the rose bug, but smaller, and as they are good flyers and hibernate through the winter in houses and sheds, are difficult to drive out when once established. They are a street tree insect, and never attack any other tree than the elm, preferring the English elm on which they were imported about 1830. We have always used a steam pump, placed on a low truck, with broad tired wheels, but will change to a gasoline engine, as soon as we can get one made and such as are used in the gypsy moth and brown tail moth work in our state fight against these insects.

The duplex pump with a Siamese attachment for hose, is by far the best and cheapest made for spraying, as two small or medium sized trees can be sprayed at once. There is no economy in using hand sprayers, as the cost is much larger. One of the best outfits for this work is that used in the Boston Park Department. I think that the most important time to spray is just as soon as the foliage is developed, and the arsenate of lead the best spraying material. I use a one-eighth inch nozzle and soak the trees.

CHRISTOPHER CLARKE,
Park Commissioner.

Northampton, Mass., 1905.

The best spraying outfit is the one with which the work in hand can be properly done, within the required time, at the least cost. It should combine minimum weight with maximum efficiency.

For small jobs hand outfits may be suitable, but for large jobs a power machine will be required. If shrubbery or very young trees, easily accessible, are to be sprayed, spraying nozzles may be best, but for high trees plain 1-8 or 3-16 inch nozzles, under a pressure of 120 pounds or more per square inch will be more economical. Spraying nozzles produce a fine mist, which adheres readily to the foliage and enables the work to be done with the minimum quantity of material, but with the plain nozzles streams can be thrown to a height of 40 feet or more, thus avoiding much climbing and enabling the work to be done with the minimum amount of labor. The object of all spraying is to cause the adhesion of enough poison to kill the pests, and this can be accomplished with either kind of nozzle.

A gasoline engine of 1 1-2 or 2 horse power, and a triplex pump, having a capacity of about 12 gallons per minute, mounted on or with a 300-gallon tank, makes an excellent sprayer for shrubbery

and low trees. For high trees, engines of at least 4 horse power, with pumps of about 20 gallon capacity, are needed, and for heavily wooded areas still more powerful machines are required.

Gasoline engines, being very portable and handy, make good outfits for all kinds of spraying work, and, for scattered trees and for roadsides are probably the best, but for wooded areas, where considerable work can be done without moving the engine, steam outfits appear to be the most suitable. A steam outfit requires a larger crew than a gasoline outfit and is less portable, but its first cost is very much less, and it is more reliable.

It is often convenient to have large spraying machines independent of the tank. With this arrangement the tank can be filled while the engine is being moved, or, if two tanks are used, one can be filled while the other is being emptied. Where water is not nearby, this often prevents much delay.

Spraying is a very efficient method of destroying scales, fungi and foliage-eating insects. In 1906 a thicket of young willows and birches, near Audubon Circle, badly infested with gypsy moths, was so thoroughly cleaned with two sprayings that the next season it was almost entirely free of them. When first sprayed the caterpillars were so large that very many of them were leaving the trees and crawling over the surrounding streets and buildings.

In 1905, eleven and one-half acres of a heavily wooded section of the Middlesex Fells, badly infested with gypsy moths, were sprayed by the Boston Park Department. This spraying was very effective and was the subject of a special report by a committee of the Massachusetts Society for the Promotion of Agriculture. The work was done with a steam sprayer and cost \$22 per acre.

In June, 1908, 329 elms on Commonwealth Avenue were sprayed for elm-leaf beetle, at a cost of fifty-two cents per tree. About one-third of these trees average about two feet in diameter and the remainder about one foot in diameter. The sprayer was a seven-horsepower gasoline machine. Some very large elm trees were sprayed for elm-leaf beetles with this machine at a cost of \$2.13 per tree, twenty trees being a good day's work. In spraying for elm-leaf beetles, it is necessary to poison the under side of the leaf, so that it is more expensive than spraying the same trees for gypsy and brown-tail moths.

The varying conditions under which spraying is done detract much from the value of cost comparisons, yet much valuable information can be obtained by keeping accurate cost and other records of the work, and I would suggest that daily records of the following items be kept: Number of sprayer, cost of labor, cost of mechanics, cost of foremen, cost of teams, gallons of solution put out, locality and kind of work, delays and causes of same, name of engineer and name of foreman.

C. E. PUTNAM,

Engineer Boston Park Department.

February 25, 1909.

We use largely for bedding plants the following: *Phyllanthus*, *nivosus* variety *roseo pictus*, from South Sea Islands.

Acalypha in four interesting varieties, namely: *Wilkesiana*, *Macafeana*, *Marginata* and *Musaica*.

These stand the sun well and last longer than *Coleus* in our soil.

WM. R. SMITH,

Supt. U. S. Botanic Garden.

Washington, D. C.

Policing

Has anyone thought of a good method of getting rid of the loafers (Sons of Rest), that infest our parks? I have some of the "regulars" that have been with me eight years. Occasionally, we miss one. I ask the men "Where is the Senator?" or "What has become of Sir Barnacle?" They are usually gone to their summer place for three or six months. We miss them, but don't worry, for we know they will return in due time.

We have no police protection for the parks, except a special on Sundays in summer. I tried rough tactics "to move them on," but found they would get square with me. I find as I am situated that using them kindly, and gaining their good will, is the best plan I have for good order. I do the same with the children and we have very little trouble.

I am worried with dogs. It seems to me that the few people who have no dog, or dogs, will borrow a dog when they come to the parks. The most of them would not care much if you abused their children, but if you insult their dog, you touch them in a tender spot. Who will originate a plan to rid us of these nuisances?

W. H. RICHARDSON,
Supt. of Parks.

Concord, N. H., Nov. 1900.

Our worthy Secretary has tackled a tough subject, one that will, I fear, disturb even his serene temper. I used formerly to think it necessary to do a good deed of amateur police work. I gradually got more sense. There is more profit in patching up little depredations than in worrying too much to prevent them. People who come to the Parks are not generally criminally intent and it is remarkable the small amount of damage they do mischievously, a police force is necessary, my experience leads me to say, let it be small, a larger force is expensive and swells the amount of the appropriation required for maintenance. The effect of a large police force on the visitor in the park is not pleasant or restful, a feeling of restraint is imposed upon him, and enjoyment is marred.

Fast driving, scorching and such violations can easily be suppressed, providing the officers detailed for the purpose are properly equipped and are rigorous in the execution of their duty. No way, however, has been discovered to prevent trails on the grass that did not prove more objectionable than the trails.

J. A. PETTIGREW,
Supt. of Parks.

Boston, Mass., 1900.

I am situated very much as Supt. W. H. Richardson, of Concord, N. H. is in regard to loafers (or Sons of Rest) as he terms them, and I agree with him as to the best way to get along with that class, for they are sure to get square with you if you are too hard on them.

H. H. WILLIAMS,
Hemlock Gorge Reservation.

Newtown Upper Falls, Nov. 1900.

I think monthly bulletins are about right as to frequency.

I have always been impressed, in designing plans for parks, with the importance of combating the tendency to short-cut trails and to the wearing out of turf along the edges of walks and have always devoted a great deal of thought and study to laying out the walks on lines that will serve so well as short-cuts that the tendency of most people to cut across the lawns is obviated. This becomes of the greatest possible importance in the smaller city parks surrounded by densely occupied residence districts. The best way to obviate the wearing of turf along the borders of walks is to have them wide and perfectly smooth and comfortable to walk upon. I should always condemn loose gravel walks for this reason and any excess of binding material which becomes muddy should be carefully avoided. In addition to this, it is well to plant occasional trees, occasional bushes and to place other ornamental obstructions along the borders of walks, or where circumstances permit of it to cover the surface with vines or creeping plants which do not invite pedestrians to walk upon them. I dislike the iron hurdle system of protecting the borders of walks so much used in England, especially in Hyde Park. It would be far preferable in such cases, as Mr. Pettigrew says, if no other comparatively reasonable and agreeable protection can be devised to repair from time to time the damage done.

I agree with Mr. Clewley that the pin oak ought to be more used as a street tree than it is. When I began the practice of my profession in 1875 I was much impressed by old Samuel Parsons' enthusiasm for the pin oak used in this way and have ever since continued to recommend it whenever opportunity offered. It is impossible not to get tired of the almost exclusive use of elms and maples for street trees, good as they are for the purpose. I have always avoided the use of the beech for street trees thinking its tendency to run its roots near the surface and its liability to suffer from excavation in its vicinity, sufficient reasons for not recommending its use in streets.

As to park police, I wish the word "police" could be dropped as regards parks. They ought to be called "keepers" or "guards" and to regard their functions as more resembling those of guards of art galleries than those of the ordinary city police. The cases in which they have to deal with crime are extremely rare as compared with the experience of city police, while their principal business is to guide and advise people in the proper use of the park and for this purpose tact and persuasion are all important and force should only be used as a rare and last resort.

JOHN C. OLMSTED.

Brookline, Mass., Dec., 1900.

A word on the protection of parks. The depredations committed, I find, are not always mischievous intentions, but rather thoughtlessness, or ignorance. This past Christmas we detailed some of our regular help who are appointed "by the Park Commissioners" as Park Police, to protect the evergreen trees against the destructive ax in the hands of some thoughtless persons, and some that are otherwise. I will cite two cases.

The first was in the densely populated part of the city, at "Crompton Park." Some of our visiting friends will remember the place. The trees were guarded until ten o'clock Christmas night, and three nights previous. We lost one small tree, and that was recovered before the boy got off the ground with it, but the boy and ax were missing. We think we did well when so many trees were wanted about that time.

The second case happened three miles away from the heart of the city, and three-fourths of a mile from any house except that of

the keeper, "Lake Park." Here a boy was successful in cutting down a spruce, but not in getting away with it, or himself. The boy was let go, promising to pay the cost of the tree. At the same park a man drove in, tied his horse, took an ax in hand, and was about to take the life of another tree, when the keeper saw him and called out, "My friend, I wouldn't cut that tree." "Why," the man asked. Then it was explained to him that he was liable to a fine. He was surprised to think that the tree was planted there and that he was doing any harm, and admitted that he would not go to Elm Park to get one, and thanked the keeper for being so gentlemanly with him. The two boys were afraid of the stern hand of the law and nothing else. The man did not need it, and would not have come there if he had thought what he was doing. We need both moral and legal suasion. Moral suasion first, this may be labeled "keeper," on the "outside" of his coat. Second, legal suasion labeled Police on the "inside" of his coat. For these same keepers are asked at times where is your authority. Then they show the police badge, which never failed yet to carry its point. Yet the first way has answered a hundred times where the second one was not needed.

"You do not want a revolver all the time, but when you do, you want it like thunder." So with the police badge.

J. H. HEMINGWAY,
Supt. of Parks.

Worcester, Mass., Jan. 1901.

We have the same trouble that Mr. Richardson, of Concord, N. H. speaks of, in regard to loafers on Taunton Green, but as long as they behave themselves we do not trouble them. We have no special officer for this park, but the regular officers on the streets look out for troublesome persons. None of them have ever disturbed the plants and flowers, except in one instance, when an intoxicated person went through one of the beds. He was promptly arrested and fined.

We have more trouble from dogs than from any other source, but the wire wickets that we have around the flower beds remedies that trouble almost wholly.

The Commissioners are more than surprised that in their efforts to improve this park, which is located in the commercial center of the city, they have so little cause of trouble, but rather a most decided approval from all sources.

CHAS. S. ANTHONY.

Feb. 1901.

The tramp and dog question is an aggravating one. Some years ago, driving from Sea Cliff to Roslyn, L. I., I noticed near the entrance to a stately country place a sign, "Wanted, 500 tramps." The owner of the place claims that since he put the sign up, the "regulars" omitted to call for their forage. It seems impossible to keep dogs out of small parks or any park which is located in the busy part of a city, which is traversed daily by a large number of people. In outlying parks, however, especially where animals are kept and floriculture is maintained, I am of the opinion that the rules prohibiting dogs to stray loose should be strictly enforced, and that a dog's life should be forfeited the minute he molests animals, (such as sheep, etc.) or endangers their lives. One or two such examples, properly published in the daily papers will serve to caution the public and will greatly stop that nuisance.

I wish I could feel as undisturbed and logical about such matters and other depredations as does Brother Pettigrew, but it is enough for me to see a dog cross a lawn or flower-bed, or get within a half a mile of a flock of sheep, or to have to look at a driver drive over borders and walks, or pedestrians walk on borders and follow trails,

to make me wish that I was a Policeman, Prosecuting Attorney and Judge, one after the other, in order to be able to soak it to the offender in proper style and lasting form. I am greatly impressed by what Messrs. Pettigrew and Olmsted say in regard to policing the parks. For instance, the stern forbidding looks of some of them "billy" swinging Tammany Policemen of Central Park, N. Y., is enough to make you walk on your toes and make you speak in whispers. At any rate you don't feel like asking them for information. A few guards in a simple uniform, just distinct enough to indicate their personality and authority may be all that is needed. If such guards are well selected men, of a willing, courteous and obliging disposition, who besides the thorough knowledge of the territory over which they have to watch and give guidance, have an understanding for nature that surrounds them, know something about trees, shrubs and animals, etc., and have the ability and good taste to impart such knowledge to interested visitors, they will serve a double purpose and increase their utility, and with it the value of their services.

THEODORE WIRTH,
Supt. of Parks.

Hartford, Conn., Jan. 1901.

Some years ago, nearly every visitor to Sea Side Park would bring one or more dogs with them, and combining these with neighboring and tramp dogs running over the park, committing nuisances; destroying beds, low evergreens and shrubs; snapping at bicycle riders; chasing horses, and often causing them to run away; biting some, barking and threatening other visitors until they are nearly paralyzed with fear; engaging in battles that would often set their masters to fighting: the bad actions of many of these dogs so far overbalanced any good qualities accredited to them, made it imperative that something should be done to control or banish them from the parks. An ordinance imposing a fine not to exceed one hundred dollars on any person who should allow a dog to accompany them, except it be secured by leash, was enforced with very good results, practically doing away with the nuisance. It is to be regretted that some people will not come to the parks because their precious little pugzy-wugzy will not be allowed special privileges, but hope they will get over it and partake again of the many pleasures that may be derived from an outing in the parks.

Of all the visitors who come to our parks, those that derive the most benefits are the persons who live in the crowded and circumscribed portions of the city in an atmosphere and surroundings that are more or less contaminated with elements that have a tendency to weaken their health and constitutions. When they come out to commune with nature in the form of lawns, trees, shrubs, and flowers, and to fill their lungs with a sun-laden atmosphere that is rightly proportioned with oxygen, nitrogen, and what our lamented P. T. Barnum used to call ozone, and should in this sweet communion turn a somersault on the grass, or "Hello, Hello to the birds, I think Mr. Pettigrew's advice is very good: "Leave them alone. Do not see them. Turn the watchman out for it is too sacred for his presence." But, on the other hand, when the vicious and evil-minded person comes in sight, let the watchman from his place that is not too conspicuous, discover him and at the very first attempt of any of his evil practices, put in use Brother Wirth's idea: "Soak him one for fair." I like Mr. Wirth's idea of the watchman as he describes him. and if necessary, educate them up to such a standard.

CHAS. E. KEITH,
Supt. of Parks.

Bridgeport, Conn., Feb. 1901.

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Organization of a Park Commission

Our bulletins are intended and supposed to bring forth information on all subjects that might be of interest and value to our profession. In the past we have considered a large number of subjects pertaining more or less to our active work as executive officers of the different departments which the members of our association represent. I would like to get the opinion of all members of our association on what they consider to be the most satisfactory and effective constitution of a park commission.

I think we all agree that politics ought to be kept out of a park department altogether and that the affairs of the department should be conducted strictly along business lines, such as one would follow in a private business. Taking it for granted that this is the sentiment of all, we come to the following question: How many commissioners should constitute a board, how long should they serve, and how should they be appointed?

To make a start I beg leave to report just how the park commission of Hartford is constituted. The commission consists of ten members, not including the Mayor, who is ex-officio a member of the board. The members of the board serve ten years and are nominated and elected by the board itself, the election to be ratified, however, by the Mayor and the Board of Aldermen. This gives the elective power to the Board of Park Commissioners alone; for if an elected member should not be ratified, it still remains with said board to elect others until ratified. By this arrangement one new member will be elected every year to fill the vacancy of the one whose term has expired. This arrangement has worked most satisfactorily up to date, the members of said board all being men of the highest standing in the community and far above petty politics.

This commission was organized in 1895 and since its creation has through its powers given by special legislation acquired lands for, and developed the present park system. Bonds were issued for the creation of the park system, and the special charter gives the commission not less than one-half mill of the grand list for the maintenance of the parks. In other words, the income of the department for maintenance is a fixed one and the commission is not dependent on the city council for an annual appropriation below said one-half mill, but the council can increase said income above the one-half per mill if it sees fit to do so.

This system so far has worked very well and the large commission I know has been of great value during the time during which the lands for the different parks had to be acquired, and the plans for the system had to be worked out. Now as the system is pretty well developed and we have come down to more or less a plain maintenance basis, I personally believe that a commission of half the number or even less, constituted along similar lines, would be just as effective and sometimes more progressive; in fact, I am inclined to think that a single headed commission, if absolutely free from political influence and interference, would be as satisfactory as the single headed management of some private concerns that handle ten times as large business transactions as does our department. This reminds me of the saying "If the little word if not were, my father would be a millionaire."

Now this whole question I think is worthy of an exchange of

ideas and experiences, even if it leaves us superintendents powerless to amend, rectify or simplify the powers above us that may be.

THEODORE WIRTH,
Superintendent of Parks.

Hartford, Conn., July 1905.

The South Park Board, of Chicago, consists of five commissioners appointed by the Judges of the County Circuit Court. Each commissioner is appointed for a term of five years; the term of one commissioner expiring each year. This board has been in existence for thirty-six years. Up to this time it has been entirely non-partisan. Political influence has not in any way governed the action of the board as to the appointment of the officials or otherwise. The fact that only one commissioner is appointed each year makes a continuous board so that a policy once adopted, as to the carrying out of improvements or methods of maintenance or other things, is usually adhered to, which, of course, is a very essential thing in satisfactorily managing affairs of any kind.

I do not know of any better method of creating and maintaining a board than this, with perhaps the one exception that a board of commissioners of three men would possibly be more desirable.

J. F. FOSTER,
Superintendent South Parks.

Chicago, Ill., Aug. 1905.

The Omaha Park Commission is composed of five members, which for the transaction of business is desirable, as one or more members may be unavoidably absent at regular meetings.

The commissioners, according to our new city charter, are to be appointed by the district judges. Their term of office is for five years, one member's term expiring each year. They serve without pay. Our present members were appointed by the mayor and council.

The park board since its formation in 1889 has been strictly non-political.

The working force is employed by the superintendent. Where men are recommended by members of the board for employment, it is with the understanding that if unsuitable they be discharged. This gives the superintendent the feeling that he alone is accountable for poor workmen. Many of our men have been in the employ of the commission twelve to sixteen years. Those who have proved worthy and well qualified, are on the pay rolls as care takers, foremen and monthly men and are thus assured steady employment. I do not know what their religion or politics are, and their nationalities are as cosmopolitan as our country.

WM. R. ADAMS,
Superintendent of Parks.

Omaha, Neb., Aug. 1905.

The Peoria Park Board is incorporated under the Sheridan road act of this state, consists of seven members; four and three are elected at a yearly non-partisan election, only one ticket in the field. Some 700 delegates ballot on the candidates and their list goes on a referendum to the voters of the district—this is our eleventh year—their appropriation is a yearly one-half mill tax (or more) in round figures \$80,000 is collected. The president is elected, no salaried officers.

From experience of twenty-three years in the West Chicago Parks, where the members are appointed by the governor, and the Peoria

system, while complicated and costly is preferable to the former, in that it goes direct to the people who use and pay the park expenses and not to a star chamber caucus where the ward healers are consulted by the governor and the jobs from scrubwomen up to superintendent are slated.

O. F. DUBUIS,
Supt. of Parks.

Peoria, Ills., Sept. 1905.

The Park Board of Springfield, like that of Peoria, is incorporated under the general act of the State of Illinois passed in 1893 governing the organization of pleasure driveway and park districts. The board consists of six trustees and a president, each serving two years. The president and three trustees are elected one year and the other three trustees the following year. The election is held in May, separate from the city, county and state elections and the polls are open to all legal voters of the park district, which includes the city of Springfield and the outlying districts for several miles in each direction. Nominations are made by petition, 250 signatures on the petition being necessary for a nomination. Since the organization of the district in 1900 there have been two tickets in the field at three elections. The original park board was re-elected each time up to last spring, when, owing to a vacancy caused by death, the opposition elected a president and four trustees thus completely overthrowing the old board. The newly elected board is opposed in many ways to the policy of the old board and we look now for the abandonment or reversal of working plans that have been in progress for several years. The old board was strictly non-partisan or rather bi-partisan, and the new board is nominally the same, but is strongly committed to the cause of union labor. For the reasons that any board, which loses half its membership every two years, is liable to have its policies reversed, by the election of new and untried men, and that a constant temptation exists, when the board is elected by the popular vote, to make the parks an annex of the city or county "machine," I am in favor of a board consisting of five members, each serving five years, one appointed each year by the circuit judges, the system that has been so conspicuously successful in the South Park Board of Chicago. This question of appointing the members by the judges was submitted to the voters of this district three years ago, but was defeated by a small margin, chiefly through the influence of the city administration.

ARTHUR HAY,
Superintendent of Parks.

Springfield, Ills., Sept. 1905.

The Board of Park Commissioners in the city of Yonkers, is composed of five commissioners appointed by the mayor. They hold office; unless removed for cause, during the two years term of the mayor. While therefore each of the mayors has had it in his power to remove all of the commissioners appointed by his predecessor, no mayor has made such a radical change. During the five years of the existence of the park department each mayor has retained some of the commissioners appointed by his predecessor, even though such predecessor was a political enemy.

The system is a bad one, but the mayors of both political parties have thus sought to maintain the efficiency of service by retaining commissioners who had shown their adaptability to the service.

FREDERIC SHONNARD,
Supt. of Parks.

Yonkers, N. Y., Sept. 1905.

When I began the work on South Park, we had a Park Commission consisting of fifteen members, often an unwieldy body, and liable to be divided into cliques. That board was abolished and a new body of five members was substituted which seems to be an improvement.

I am inclined to think that five is about the right number, though perhaps three is enough.

After all it is not the number, but the quality of the members that counts. If appointed for the building up of a political machine, even three is too many; if appointed on account of their broad views and public spirit, there is little danger of getting a board too large.

JOHN F. COWELL,
Superintendent South Park.

Buffalo, N. Y., Oct. 1905.

The Board of Park Commissioners since its creation by the state legislature about sixteen years since, has consisted of twenty-one members, and are appointed by the mayor for various five year periods. This may appear quite an unwieldy number, but its administration of park affairs has been clean and successful. The power of the superintendent has never been hampered in any way towards the dismissal of incompetent employes. The chief argument in favor of such a large board is mainly in the difficulty of any selfish political scheme, existing in the park management under the observation of such a large number of keen business men. On the other hand it may occasionally happen that a board of three or five members may form conclusions a little more quickly about administrative details, than a much larger body.

JOHN DUNBAR,
Assistant Superintendent of Parks.

Rochester, N. Y., Oct. 1905.

A board of five members is large enough. The term of a commissioner's service should not be less than five years, political affiliations of a commissioner should not affect his duties as such. Parks and politics should not be chums.

GUSTAVE X. AMRHYN,
Superintendent of Parks.

New Haven, Conn., Nov. 1905.

The Bridgeport Park Board consists of four members; two of which are appointed on the first of January each year for two years; one from each party, the mayor is a member ex-officio, but must preside at the organizing of the board when new members have been appointed; also in March when the clerk and superintendent are engaged for a year. This plan worked splendidly for a great many years when the commissioners would take great interest and give their best efforts for the advancement and up-building of our beautiful parks, but in all communities there is the peanut politician and grafter, who thinks only of that that can be squeezed from the department, or the placing of some person or persons who could not be of any benefit to anyone or thing, only as a fertilizer planted good and deep under a tree or rank vegetable growth. I think that both of the systems used in Hartford are good. The ten good men with terms of ten years each. Also the Keney Park System, with the three trustees for life. If all cities could only select such excellent men to place upon them, all would be well. Perhaps the best results could be obtained from a single headed commission, if he

could only be placed beyond the reach of the very much cursed peanut politician. I have sometimes thought that a board of five members would be right. One appointed every two years for ten years. The board itself to appoint the new member. The mayor ex-officio. And the first member from the top to the waterboy that introduced politics or religion into the department should be immediately suspended from any further connection with the parks.

CHARLES E. KEITH,
Superintendent of Parks.

Bridgeport, Conn., Nov. 1905.

The Essex County Park Commission is composed of five members appointed by the judge of the supreme court of the county for terms of two years each and to serve without pay in the acquirement of land for public park purposes and the disbursement of funds (now having exceeded four millions of dollars), in such ways as in their judgment seems best, together with an annual maintenance sum based upon the total taxable valuations of the county, a sum not less than one-half mill per dollar and not exceeding three-fourths of a mill per dollar on the total tax ratables of the county; this sum to be levied by the county freeholders and turned over to the park commission.

The power for obtaining money for these purposes was created by acts of legislature and ratified by a vote of the people.

The commission has been composed of men of the highest standing of the community, their management has been free of politics and they have aimed for business-like results in both construction and maintenance and the system as a whole has worked very satisfactorily.

WM. S. MANNING,
Superintendent Essex County Parks.*

Newark, N. J., Nov. 1905.

The Queen Victoria Park at Niagara Falls, differs in some respects from other parks in that the board is appointed by the Government of the Province of Ontario and acts as trustees for the province in the administration of the property.

Title to the lands acquired for the original park area at Niagara Falls were taken in the name of Her Majesty Queen Victoria and a considerable portion of the lands subsequently added and which now form part of the Queen Victoria Niagara Falls Park system are Crown Lands, which have been set apart for the purpose of the park by the government of the province, while other portions are military lands, which have been leased to the province and the commissioners by the Government of Canada.

The commissioners are appointed by the Lieutenant-Governor, in council and serve during the pleasure of the Government; the present chairman has been on the board for over twenty years, the other members having served a shorter period. The commission consists of five members, and in all matters which are of importance the commissioners act under the advice of the Premier.

The park revenues are wholly obtained from the franchises granted within the park and the Province has not been called upon to pay for either the creation or maintenance of the property, which now extends along the bank of the Niagara river from Lake Erie down to Lake Ontario.

This act creating the park board is the only constitution we have, and it is of course subject to the jurisdiction of the legislature.

JAMES WILSON,
Superintendent of Parks.

Niagara Falls, Ontario, Nov. 1905.

The board of commissioners of the State Reservation at Niagara, consists of five members who are appointed by the governor for a term of five years and is as near non-partisan as possible. They serve without pay and are chosen from among the most prominent and public spirited citizens of the state. Their unselfish devotion to a thankless duty testifies to their love for the beautiful in nature and is a shining example to all Park Boards. Their endeavors to preserve the integrity of the Falls of Niagara have led them to carry their battle even into the State Legislature and have assisted very materially in moulding public opinion in the desired lines.

It would seem to me that a Board of more than five members would be unwieldy and that where a set of commissioners show peculiar fitness for the duties incumbent upon them they should be retained as long as possible. Three of the present members of this commission are now serving their second term, one his third and the other his first term of five years.

EDWARD H. PERRY,

Superintendent State Reservation.

Niagara Falls, N. Y., Nov., 1905.

Our Board is composed of ten members; two being appointed each year by the Resident Judge of the Supreme Court for a term of five years and four members ex-officio (The Mayor, City Surveyor, President of City Council and Chairman of Finance Committee of Council.)

Although seemingly large, it is not at all unwieldy and while all take an active interest in everything relating to the Park, yet nearly all questions, excepting those outlining a general policy of the board, are referred to an Executive Committee for decision and action. The committee composed of three men and the president. The general board meets monthly and at that time a report of the doings of the Executive Committee, who meet weekly, is submitted for approval. In fact one might say with approximate truth that the governing power in matters relating to park affairs is vested in a body of four men with an Advisory Board of fourteen, including themselves.

There is no pay attached to the position and politics have never swayed their decisions in the smallest degree. The ex-officio members being elective officials, necessarily change from time to time, but it has been a regular practice so far, for the two retiring members to be reappointed each year. In fact, some of the members have been connected with the board since its inception in 1883 and the only changes occurring in its personnel are those caused by death. This works very well as the decisions of the Board in any one year are not liable to reversal in the next.

By its charter the board is compelled to report annually to City Council, but the latter body has no authority over its actions.

The yearly appropriation is made by council and the amount is fixed by them although there is a minimum beneath which they may not go.

ALEX. J. TAYLOR,

Superintendent of Parks.

Wilmington, Del., Dec., 1905.

Our commission is composed of five members elected by councils in the fall of 1902 to serve five years at which time a whole new commission will be elected by councils. It would seem that the number is a good one, but the whole commission being elected at one time is bad. Our funds for establishing the system have come

from a loan of \$250,000.00, but for maintenance we are dependant on council's appropriations. Considering the danger of politics creeping into the constitution of a commission it would seem as though either appointment by the court or election by the board with confirmation by councils were even better methods than election by councils. The Springfield and Peoria, Ill., method seems bad. If one member each year could be elected in that way it would seem at least theoretically ideal.

F. L. MULFORD,
Superintendent of Parks.

Harrisburg, Pa., Dec., 1905.

The Board of Park Commissioners of the City of Worcester is made up of five members, one of which is appointed each year by the Mayor, which is also confirmed by the Board of Aldermen and Common Council. Ever since its organization, it has been composed of members of both political parties. This has been found to work better than to make it strictly a partisan Board.

As we have a distributed park system comprising fifteen different tracts, it has been deemed wise to have each commissioner assume a general oversight of several of the parks. This in no way interferes with the functions of the Park Superintendent, as all directions to the help are given by him. In this way, at each monthly meeting of the Board, it is possible to keep well informed of the progress being made in the development of the newer parks as well as the care exercised in the maintenance of those first established.

JAMES DRAPER, B. A.,
Secretary Park Board.

Worcester, Mass., Dec., 1905.

The Board of Aldermen, biennially, elect one member of the Board of Street and Park Commissioners for a term of six years; not more than two members can be of the same political party. The board consists of three members, and has full charge, management and control of the building, contracting, repairing and maintaining of all the streets, highways, lanes, sidewalks, bridges, public sewers and drains, and public parks and commons: salary of each member \$600.00 a year, and each is allowed \$150.00 annually for horse hire.

The system is a political one, and far from ideal, but in this comparatively small city has perhaps worked out in practice better than there was reason to expect, if so, however, it is obviously not due to the system itself, which is a relic of the days when politics dominated everything connected with municipal affairs.

The subject of the present bulletin is of special interest, and the facts brought out cannot fail to be of great value, being thus brought together and offering an opportunity for comparison. With such diversity of methods in process of being tested simultaneously throughout the country, it must follow in time that the best, modified to meet local conditions, will be generally adopted. Already it is encouraging to note the prevailing tendency to remove the management of public parks from political control.

BYRON WORTHEN,
Superintendent of Parks.

Manchester, N. H., Jany., 1906.

The subject under discussion is one that has greatly agitated the minds of certain wise and good people of this city during the last

three months. The war cry, "Divorce politics from park management," clearly indicated that the Park Board has been and is dominated by political considerations. The City of New York for the purpose of simplifying its government has been divided into five political subdivisions called boroughs and its divisions named respectively, the boroughs of Manhattan, Richmond, Bronx, Brooklyn and Queens. The parks of these five boroughs are in charge of a Park Board composed of three members drawing an annual salary of five thousand dollars each, appointed by the Mayor, and their term of office terminates with that of the appointing power. The same has heretofore been two years, but lately it has been extended by the State Legislature to four years. Two of these commissioners are each in charge of the parks of two boroughs, the third of one only—(The Bronx), and the powers of each commissioner in the management of the parks in the boroughs under his jurisdiction are absolute. Thus we have the Commissioner of Parks of the Boroughs of Brooklyn and Queens having absolute charge of the care and management of the public parks, parkways, squares and public places of the above two boroughs, except as to the making of rules, regulations and ordinances which are made by the Park Board, as are likewise all contracts for park construction work and the furnishing of supplies in large quantities. All the supplies costing less than one thousand dollars can be purchased by the individual commissioners without public letting.

Each commissioner is empowered to appoint his own superintendents, engineers and other employees subject to the civil service rules of the State and also expend the money allowed him for park maintenance and construction as he deems proper.

The amounts necessary for park maintenance are designated by the Board of Estimate and Apportionment, and are put in the yearly tax levy. The money required for park construction is raised upon bond issues and the amount is also determined by the Board of Estimate.

The weakest point in our park management is illustrated by the fact that the Park Board has not the initiative in the selection of new park sites, but the same are made by what is called a local board of improvements, said board consisting of the aldermen elected in this district, subject to the approval of the Board of Estimate and Apportionment, the Park Commissioner having but advisory powers in the matter.

When it is considered that the Park Department of the City of New York last year employed over two thousand men and expended over four million dollars in park construction and maintenance, it does not seem strange that politics are firmly rooted. As indicated above some of the most intelligent and progressive citizens of the metropolis have discussed a scheme to change all this and have a Park Board of five members, one from each borough, to serve without pay. The appointing power to be the Mayor and the term of one commissioner to expire each year. The superintendent is to be the real head of park management. He shall, when appointed, have had at least ten years' active experience in park construction and management and shall hold office during good behavior. But, will the politicians let go? May I be pardoned for saying, that even the American Association of Park Superintendents can't make them do it.

W. J. ZARTMANN,
Superintendent of Parks.

Brooklyn, N. Y., Jan., 1906.

I have had practical experience with probably a larger number of park commissions than most of the other members of the associa-

tion and I am glad to be able as a result of that experience to heartily endorse what appears to be the opinion of the majority, that an unpaid park commission of three or five members, appointed in the former case biennially for a term of three years, and in the latter case appointed one each year for a term of five years, seems best adapted to ensure continuity of policy, adequate study and discussion of all projected improvements and a reasonable regard for public opinion.

I want to call particular attention, however, to the undesirability of a single Park Commissioner. There appears to have been of late years a strong movement in favor of securing greater efficiency in the administration of various city departments by the appointment of a single head. That, I think, in the case of most of the departments is an excellent idea, but I am sure it works badly in the case of a park department. The reason is that the element of aesthetics is so much more important in the case of a park department than in that of any other; and if there is a single Park Commissioner he has the power of giving effect to all his individual ideas as to taste so far as money is available, the result of which is that there is a lack of continuity of policy in this most important aspect of the subject and there is also too much opportunity for the execution of what can scarcely be called by a more dignified name than "whims." I believe, therefore, that the element of comparison of views and discussion which can be secured by a larger membership in the Park Commission, is of very great importance. I believe that the executive work and a great deal of the responsibility for the business management of the parks ought to be placed upon the superintendent, and the less the members of the Park Commission have to do as individuals with the execution of the plans and purposes of the board as a whole and the more they rely upon the superintendent, the more likely they will be to secure efficient and economical management and to secure an able and intelligent and experienced superintendent.

Where there is a Park Commission of several members, the worst possible results in my experience have come from dividing the supervision of park work among them according to districts and expecting each one to decide nearly all questions for his district without discussion with the board and often without votes of the board.

By far the best results are secured by having the superintendent report in advance every year in considerable detail the work proposed to be accomplished, together with an itemized estimate of the cost of work. Such a report can be discussed and passed upon item by item and the work authorized by the board, after such adjustments as are necessary to keep the total expense within the available appropriation. Of course there should be a certain portion of the appropriation reserved for the accomplishment of purposes which cannot be foreseen and which when they do come up cannot be very well postponed until the following year.

With a large board of nine or ten or more members there is a good deal of time wasted in useless discussion and the meetings are so tedious that able and energetic men will not be likely to remain on the commission or will refuse to be appointed.

I have noticed, too, that when there are large sums to be expended for the purchase of land and improvement of parks it is not difficult to obtain able and experienced business men to act as commissioners, but when the work settles down to routine maintenance the attendance on meetings becomes tedious and uninteresting and the quality of the Park Commission is very apt to deteriorate. For this reason I believe the meetings should not be oftener than once a month and the business should be presented to the meeting in good shape by the secretary and superintendent, so routine matters can be rapidly disposed of. At the same time, the superintendent can

often keep up interest by submitting reports on attractive projects for new improvements in existing parks or for new parks or parkways. It is also a good plan for the park superintendent to occasionally urge upon the commission visits to other cities to familiarize themselves with successful park works elsewhere.

JOHN C. OLMSTED.

Brookline, Mass., Jany., 1906.

The Commission of Lincoln Park is appointed by the Governor of the State, by and with the advice of the senate, and consists of a body of seven men, each appointed for a period of five years and until their successors are duly appointed and qualified. The members of the board serve entirely without compensation and form a corporate body under the laws of the state of Illinois, which gives them powers of a quasi municipality.

The geographical limits of the park district are fixed by act of the legislature as is also the method of levying taxes thereon, so that governmentally and financially the park system is entirely independent of city control.

The jurisdiction of the park board over playgrounds, boulevards or park areas acquired from time to time remains the same as over Lincoln Park, the original park of the system. The Commissioners are authorized under the law to issue bonds on the towns constituting that part of the city of Chicago included in the Lincoln Park district, the interest and sinking fund for these bonds being paid out of the taxes. The Commissioners have also power to borrow to the extent of \$50,000 in any one year.

Land may be acquired by donation, purchase or condemnation, which land may be paid for and improved from bond issues or from the regular income from taxes. The board has power to enlarge Lincoln Park by reclaiming the submerged shallows of Lake Michigan, and has jurisdiction over such submerged shallows lying within the district, and may acquire by purchase or condemnation riparian rights vested in property owners.

It is provided that the Board of Park Commissioners can inaugurate themselves, at any time, into a Board of Local Improvements and can proceed to levy special assessments against contiguous property for the improvement of any boulevard in the same manner as a corporate body of any village or city within the state.

The Commissioners are empowered to make ordinances regulating the control of the parks and boulevards under their jurisdiction to maintain a police force and to punish offenders by fines or imprisonment, said fines to revert to the Commissioners and all costs due to imprisonment of criminals in city jails to be borne by them.

All branches of the park's activity are under the supervision of the Superintendent who is also Secretary of the Board. The work is grouped into departments in charge of a department head, who reports directly to the Superintendent.

Men are employed and discharged without civil service restrictions, their length of service depending entirely on their merit.

Under the law all purchases of \$2,500.00 or over must be submitted to open bidding, in reality, however, all purchases are made on a competitive basis.

The virtue of the system as a whole must necessarily depend upon the personnel of the Board and the integrity of the Governor. In times past the Park System has been steeped in politics to the obvious detriment of the work. Perhaps to public sentiment more than anything else is due the present condition which is the reverse of that under the old regime.

MYRON H. WEST,
Supt. Lincoln Park.

Chicago, Ill., Oct., 1910.

THE COMMISSION PLAN OF CITY GOVERNMENT AS APPLIED TO PARKS WITH ORDINANCE GOVERNING SAME.

The city of Cedar Rapids is conducted under the Iowa Commission Plan of city government, which provides for a mayor and four commissioners, elected by the entire vote of the city, who devote their entire time to the business of the city, each having charge and control of a different department and held personally responsible for his department.

Having charge of the Department of Parks and Public Property, it necessarily follows that I must take a more active part in the management of the parks than under the old system of park boards. Under the commission plan the head of the Department of Parks only is responsible to the people for the proper administration of the park system, as at any time under the law, he can be recalled by petition of twenty-five per cent. of the voters for any act which in their judgment is detrimental to the city. Therefore the Commissioner of Parks is in fact charged with any and all things of any nature pertaining to the parks of our city and is in reality commissioner and superintendent combined.

Under our plan we have a caretaker for each of our larger parks, four in number. The caretaker receives his instructions direct from the commissioner and is held responsible by the commissioner for his particular park. The superintendent has charge of the larger park, including green houses, and some twenty small parks wherein no permanent caretaker is employed. The result is very satisfactory to our city, the superintendent being responsible for his particular park only and such small plats as are placed in his charge. Under such plan there is no bother with differences of opinion that naturally arise from a large board of commissioners, the city council only having the power to change any contemplated action. We have found a spirit of ambition in each caretaker to make his park a little better than ever before, and being given more power, if naturally competent, makes the best of his opportunity and if not competent he holds the job for a very short time. It is, I think, undisputed fact that one boss is better than two or several, and the commission plan proves the correctness of this rule.

Under the ordinance responsibility is placed where it rightly belongs. The commissioner must bear the responsibility which the city demands and for which he is paid. There is no excuse for attempting to place mistakes on the shoulders of others.

The ordinance is as follows:

Department of Parks and Public Property.

"Sec. 7. The Superintendent of the Department of Parks and Public Property shall have charge of and supervision over Bever Park, Ellis Park, Riverside Park, Daniels Park, Greene Square, Whittam Park, Huston Park, Redmond Park, and of all the zoological and botanical gardens and all other public parks, playgrounds and pleasure grounds within or belonging to the city, and all animals, birds, reptiles, live stock, plants, trees and shrubbery contained within; and of all officers and employes, including park policemen employed in or about said parks and pleasure grounds, of all property belonging to said parks and pleasure grounds or kept or used in connection therewith. He shall have charge of and supervision over all boulevard and street parkings and parkways. He shall have charge of and supervision over the improvement, maintenance, lighting and care of all said parks, pleasure grounds and cemeteries and of the buildings therein or thereon. He shall have charge of enforcing the law and ordinance relating to the improvement and care of street parkings and the planting and trimming of trees therein and the establishment of a residence

building line. He shall have such assistance from the civil engineer and the engineering department as may be necessary in surveying, laying out improvements, and otherwise improving the parks, and may, on application, receive assistance from other officers and departments of the city."

A park superintendent to be successful must be a lover of the woods and fields. He must know men and how to handle them. His order must be law but in the application of orders, he should possess the faculty of enforcing them with the least friction. He should have the ambition to get better results each year than the year before. He should study new ideas and apply same when and where needed. He should attend conventions of park superintendents where such ideas are presented and discussed. He should be firm but just. He should have the right to employ all workmen under his charge and not be compelled to accept incompetent and unreliable hands for the purpose of boosting the political ends of the commissioners or city officials.

H. S. KEFFER,
Commissioner of Parks.

Cedar Rapids, Iowa, 1909.

The Duties of a Park Superintendent

The duties of a park or reservation superintendent are largely administrative; they cover both constructive and maintenance work. For the economy of both constructive and maintenance work the superintendent is generally responsible. The position, therefore, is one requiring intelligence, administrative ability, and an intimate acquaintance with the many details covering such work. The superintendent should anticipate the demands of the seasons in the routine of his duties, and the demands, especially of the public, in the legitimate uses of the parks, or reservations, over which he has general supervision.

Wherever consistent with the civil service rules, his force should be selected with discrimination and with especial fitness for the line of work to be performed in each individual case.

He should organize and discipline his force and centralize, where possible, all responsibilities, in order to remedy abuses and to quicken effort.

He should endeavor to get his subordinates interested in their work, and praise them when they do well. He should instruct willing workmen and not waste time on unwilling or sullen workmen, if he can do otherwise. His maxim should be "a stitch in time saves nine," as in continuous and not intermittent repairs there is true economy and consistent maintenance of all surfaces.

He should never allow adverse criticism, from a public or outside source, to draw his attention to defects in surface conditions, or in any branch of his administration. He should put his best efforts in his work, and remember that the eye and brain are worth more than the hands.

He should keep an accurate account, or daily journal, of each day's work, and his foreman should return him at the end of each week written statements of the days or hours of labor spent upon the several surfaces, roads, walks, lawns, waters or planting, etc., so that he can secure full information as to the cost of all the details of his administration and thus extravagances, if any, be checked. Upon these statements of cost, he can base his yearly estimates and his budget be prepared. He should keep posted by reading, observation and by occasional trips to other park or reservation centers and see how the administrative features are there conducted. A hint, or suggestion, might often more than pay his traveling expenses.

A park or reservation never runs itself, but obtrusive administration is objectionable and distasteful to the public. The superintendent should never shout at his employees or reprimand them in public.

A monthly report should be made by the superintendent to the commission, or governing body, covering the work of the previous month. If this report is sufficiently detailed, a summary at the end of the year will furnish in the main all data for his yearly report.

The office work usually covers the general accounting of all receipts and expenditures, and the filing in duplicate of all pay rolls and vouchers, together with copies of all correspondence, letters and communications.

A man's personality is usually reflected in his work. In no branch of duty is this more apparent than in the administration of parks, reservations or public grounds. In the instance of the Niagara reservation, this statement is especially applicable.

A purely executive officer, without a knowledge of tree and shrub

growth, and the wealth of indigenous flora peculiar to that locality; without the true spirit that would preserve the natural conditions that make the exceptional charm particularly of Goat Island and the small islets bordering it, and without an experience or training that would prompt a restoration of these features to parts of the territory requiring such treatment, would not meet the requirements of the position of superintendent at the Niagara Reservation.

The desire and aim of the reservation commission has been to obliterate all features of an artificial or obtrusive nature; to confine the constructions to simply the actual requirements for public accommodation; to restore, as far as possible, the primitive conditions of the site, and to give the public all the latitude consistent with a careful maintenance and the preservation of these natural features.

The reservation is in no sense a garden, and the florist has there no field for his efforts. The planting must be (where used) of indigenous or native growths, and the most careful and intelligent use of even this material is required.

As the grounds are frequently subject to large incursions of people, every facility offered is at such times crowded to its utmost capacity. The roads, walks, wooded paths, and in fact all wearing surfaces require continuous and careful attention in order that satisfactory, cleanly and pleasing conditions may be maintained. The public, or at least some element of the public, requires at such times proper restraint and guidance.

As the Falls, and the Niagara Reservation, are the mecca of most foreign and domestic tourists, using the word tourist in the sense of an intelligent and cultivated class, the surface conditions of the reservation, and the personality of the administrative officer, are matters to be well considered.

WILLIAM S. EGERTON,
Superintendent of Parks.

Albany, N. Y., February 15, 1904.

At the request of the State Civil Service Commission, located at the State Capitol in Albany, N. Y., the above paper was prepared. It would seem to cover the inquiry, "What Are the Duties of a Park Superintendent?" not exceptional or peculiar to the State Reservation at Niagara Falls, N. Y.

W. S. EGERTON.

A subject of vital interest to the members of our association and a discussion which should be profitable to all of us.

In the first place, I believe a superintendent of parks should be a man of broad general education supplemented by an extensive practical experience, capable of securing the best results from every man in his service as well as holding the confidence and co-operation of the taxpaying public.

Our own city has been fortunate from the beginning of its park work in having the services of intelligent, broad-minded and non-partisan Boards of Park Commissioners who have relied upon the skill and genius of the landscape architect, Mr. George E. Kessler, to advise, plan and design the features of our park system, so I shall not in this paper discuss the creative duties of a park superintendent, though they are very essential and the superintendent should not be without qualification as a landscape designer.

I would for convenience class the park superintendent's duties under the heads Administrative and Diplomatic.

He must wisely make selection of his foreman and the heads of the different branches of the work with a view not only of secur-

ing the highest degree of efficiency and skill in each department, but of securing men who will co-operate harmoniously with other branches of the work, of men who can receive orders as well as execute them intelligently, and of men who will at all times treat the public with courtesy, oftentimes the man's personality makes impossible an otherwise capable employe.

A superintendent who for political reasons or other cause cannot be perfectly free to select his own assistants, foremen, inspectors or responsible heads of the various departments is at a great disadvantage, for these are the men he must not only depend upon for the construction and maintenance of his work, but through whose faithfulness, efficiency and courtesy will the taxpayer be made to feel that the public funds are wisely and honestly spent.

It is his duty to know that each man placed in charge of a piece of work understands fully every detail in connection therewith before the work is begun.

The foreman should be allowed the same freedom in employing and discharging his laborers as the superintendent exercises in selecting his foremen, for this definitely fixes responsibility.

The superintendent should require brief reports from his subordinates on cost of labor and materials of different pieces of work when completed, the record thus made will tend to promote the energy and efficiency of the foreman.

It is the duty of the superintendent to keep thoroughly in touch with conditions on every portion of the park system under his charge, going over it frequently and making memoranda in the field. In this way only can he hope to keep thoroughly abreast of things and be ready for any emergency which may arise.

In the office it should be the duty of the superintendent to have his improvement plans prepared and approved far enough ahead, that he may enter into their execution at the proper season, avoid rush jobs as much as possible, they are expensive in more ways than one.

He should keep clearly in mind his available funds for the fiscal year and reserve a sufficient amount for the best possible maintenance of the finished properties before undertaking improvement work.

Under the diplomatic head, I should say that it is of great value to the superintendent to cultivate a pleasing personality not only with his employes, but with the public—men, women and children; his work is entirely that of creating pleasure for them, and if he can accomplish this result always in a pleasant way, it will add immensely to his value as a superintendent. The more friends he can make with the children in his parks the greater his security from their depredations.

The greater their co-operation with and appreciation for beautiful yards and grounds adjoining his parks and boulevards, the easier it becomes to maintain the public grounds and maintain a sentiment in their favor, and again the superintendent needs with his pleasing personality well developed traits of firmness and fairness in meeting those who may be seeking personal privileges. He should be able to deny their requests without making them enemies to his work and administration.

Finally. The question, "What Are the Duties of a Park Superintendent," might be very briefly answered in this way: Do his very best at all times and under all circumstances without losing his temper.

Fully appreciating how far short of the above qualifications the writer feels himself to be, I nevertheless submit this for consideration, in reply to what are the duties of a park superintendent.

W. H. DUNN,
Superintendent of Parks.

Kansas City, Mo.

A park superintendent's duties depend upon the scope of his authority. If they contemplate the general management of the parks of a city his duties are more directory than if they contemplate the execution of work in a single park.

If a city has a park system, as all cities should have, I think the executive head should be "General Manager of Parks," and for each subdivision a "Superintendent" should be employed; these latter with the "Engineer of Parks," who should be a landscape artist as well, should form the former's staff.

A "General Manager of Parks" should be an executive man; one with keen perception; one who is a judge of men, who can tell at a glance whether a man is capable of filling a given position or not. He must have a general (not necessarily technical) knowledge of landscape work. But over and above all he must understand economical business methods. His office should be a clearing house for the entire system. He should be able to tell each day how many men are at work and what they are doing. He should hold his superintendents responsible for effective execution of work. For the artistic and proper appearance of their respective parks. The superintendent should be allowed the employment and discharge of the men under him, and so far as is consistent, he should be allowed the designing of the landscape in their parks as well as placing of flowers and shrubs. Of course the "landscaping" is in the hands of the engineer, but if the superintendent is competent the engineer should carry out the latter's ideas rather than his own. An architect designs a home so far as possible to meet the ideas and suggestions of the proprietor, so should the engineer work to the ideas of the superintendent. A competent superintendent will be able to ascertain in a general way what the general manager's desires are, and execute them. If the system is not large enough to require a general manager, then the superintendent should consult the executive officer of the park board and work to his general ideas and suggestions. It will not do for either the general manager or superintendent (as is too often the case) to assume that when once installed as such they are absolute. That their employer is no longer in existence; sooner or later this presumption will get a setback to the astonishment of its possessor. The too prevalent disease of egotism, "big-head," is a dangerous and somewhat contagious trouble among park superintendents, and the sooner it is eradicated the better for the parks and the superintendents. There is no man so able or so competent that his services are indispensable, yet they can be illy spared. Ability shows in works done. Noise grates the finer sensibilities. The man who does things gets more agreeable notice than the man who continually "toots his horn." Besides the man who talks of his ability, and what he has done, is continually under the lime light with his employer and employes and he soon becomes a target for their contempt unless he is able to more than make good his pretensions. Such a man will soon create discord among his men. His familiarity with individual employes creates jealousy and discontent. Consequently neglect of duty. What a competent park board wants is execution and the people look to it for success and condemn it for failure. I believe a superintendent should have as much latitude as is consistent with reason, but I do not believe a park board should hand over its authority, or reins of government, to any manager or superintendent. That is not what our board is elected for.

Any board of competent business men will not interfere with a competent manager who confines himself to his proper sphere, but its members will be alert to any over exercise of authority unless the competence and faithfulness of the manager be fully substantiated. Execution with economy is one thing, ostentation and pretence is quite another.

Finally a superintendent should be a lover of order, and be able to preserve harmony and respect among his employes and his heart and soul should be in his work; then he should have proper and full compensation for good service well rendered.

I am largely in sympathy with the contents of Mr. Egerton's letter.

NELSON BENNETT,
Manager of Parks.

Tacoma, Wash., Jan. 1909.

The duties of a park superintendent are often governed by local conditions, but these duties should, as far as possible, meet the needs of the people.

In justice to the taxpayers I want to add one more to the many duties of the park superintendent, because I believe that a majority of citizens in every city are in real need of some expert advice pertaining to the contemplated improvement of their private grounds.

The park superintendent should be the proper person to give this information and he generally is, because he has or should have some definite scheme or object in view. He gives this problem of general effect and harmony all his thought and attention and consequently the result must be an improvement.

For example—a boulevard is either benefited or injured by the planting upon the adjoining property, and in a like manner, is one lot owner's property affected by the planting of his neighbor. It is easy to foresee that when such a privilege takes hold and is appreciated by the citizens it will require additional assistance, but if it is always worked out in harmony with the work of the park superintendent the small additional cost sinks into insignificance when we consider that we are not only benefiting the majority, but are parking the entire city instead of a few chosen lots.

By the above I do not mean that the park superintendent shall carry out any of the work in detail, but the suggestions he would make would be of great assistance. So many more would be encouraged by the assurance that they were working along the proper lines, that this would surely broaden the work.

I know of small lot owners, who have room say for possibly a dozen plants. These owners often have a favorite plant they wish to nurse, but there doesn't seem to be anyone to tell them whether the location or soil is favorable for the growth of their favorite, or whether it would harmonize with the planting of their neighbor, etc.

Of course it does not always follow that because it is policy to go to law over some cause, that the cause will receive justice. The park superintendent must be able to tell at a glance when it would be advisable to have a preconceived plan before beginning operations for improvement. But as I said before, the general public superintendent is the person to arouse this interest and give the needs a little more light on these subjects, and I believe the park public this advice that is so important to the success of park work.

WILLIAM G. MACLEAN,
Foreman of Parks.

Madison, Wis.

I will not attempt to set forth in as masterful a manner the duties of a park superintendent as has Prof. W. S. Egerton, but will state specifically the duties that have devolved upon the superintendent of parks in Cincinnati during the past three years.

First, to have complete charge of the employees of the park

department, selecting from them thoroughly suitable men for foremen, mechanics, teamsters, gardeners, &c., which is necessary for the purpose of carrying on the best possible features of maintenance that can be accomplished with a floating class of employees and a limited appropriation (which necessitates dispensing with the services of a majority of the men through the fall and winter months). I use the word "floating" because it so fittingly describes the employees of the Cincinnati parks during the past three years, and up to the present time. The financial cause of this condition is set forth above, and I am sure it parallels with the experiences of my brother superintendents to a large degree.

The most discouraging and by far the most potent factor in our park department has been politics during the past three years. This factor has wrought two complete changes in the entire force, from and including the foremen, down to the lowliest laborer.

Thanks to the citizens of this splendid old town, who always assert themselves at the crucial moment, there has been a non-partisan park commission appointed, who will place all park employees on their merits from this time on.

I will state at this point that the duties of a superintendent of parks in Cincinnati have been more arduous during the past three years than in most cities, for the reason that there had to be created a children's playground department, an engineering department, a public comfort station (a feature unknown to this city heretofore), though to-day this department has the finest equipped station of any city in the United States.

A department of forestry and entomology has been established, and equipped with spraying machine and necessary paraphernalia for the annihilation of scales and leaf-eating insects, which work is now carried on efficiently with the most modern appliances known. This adds greatly to the department in the condition of trees and shrubs, both in the parks and along the streets.

A nursery is now being established, and from this it is expected to transform the horticultural condition of the parks, as well as street tree-planting.

The street planting in this city has not, up to this time, been a part of the park work, but it is hoped as soon as there can be funds available, that this feature can be taken up. The dry, hot atmosphere of this latitude has discouraged the residents of this city in planting street trees, their reward being only to see them wither to a large extent during the first summer.

Our department has kept an attractive display of tropical and blooming plants at the park green houses during the entire season, and special displays of chrysanthemum, orchids, and Begonia Gloire de Lorraine during the months of November and December. and lilies, azaleas, gloxinias, orchids and aquatics during the months of March and April.

There is also a special feature of floricultural planting in the down town parks, both with exotics and tropical plants.

In line with this work is the superintending of the planting in the school gardens and window boxes of the public schools, the Women's Club, Associated Charities, &c., and the delivering of lectures on the subject of playgrounds, children's vegetable and flower gardens, horticulture, and tree planting, especially in the suburbs and adjacent villages and towns.

The preparing of estimates for the amount of the annual appropriation for park maintenance, assisting in selecting new property for the enlargement of the park system, and the preparing of estimates for improving same, are among the routine duties, as also are experiments with road materials for the purpose of maintaining a smooth and lasting, dust-proof surface for the park drives and walks.

This condition has been attained by using a limestone screening with an abrasion not to exceed ten to fifteen per cent. This is used at a thickness of about three and one-half inches, thoroughly rolled and ironed out to a smooth surface, then treated with a residuum oil, or a soap, water and oil emulsion.

Some of the special duties have been providing work for the unemployed (a duty which has been among the most arduous to perform), arranging for concerts, providing by popular subscription for down town concerts, and compiling annual reports of the department, and of a necessity anticipating the needs of the various parks, placing credit and commendation where deserved and lending such personal assistance in general work as time permitted.

J. W. RODGERS,
Supt. of Parks.

Cincinnati, Ohio., Jan. 1909.

The duties of a superintendent may be divided into several classes. Some or many of which are very pleasant even though they do keep you hustling early and late throughout the season, while others, when you think you are performing them to the best of your ability and knowledge, some little trivial affair may occur that will lead you a devil of a time until the thing blows over.

The first duty of a superintendent is to secure and retain the good graces of the powers over him. He should be subservient, but never to the loss of dignity, to his commissioners. He should ever keep in mind that all the gentlemen on his commission are giving more or less of their valuable or valueless time without compensation, and they each and everyone must be respected and their opinion must be considered. Men cannot think alike, so when a commissioner differs with the Superintendent, try it out on his plan, and if a success, he will say "I told you so," but if wrong he will give you credit for knowing your business.

Then there is the leading citizen who has given more or less of his worldly possessions in land, money, etc., for park purposes. It is the duty of the superintendent to cater to his every want and to give him every respect.

The duty that is most likely to make trouble for a superintendent is the hiring of his help. A commissioner or city father is approached by a person who has lived beyond his days of usefulness, or was never of any use, and request him to use his influence to get his name on the park pay roll. The superintendent complies and very soon finds out that he is absolutely of no use, in fact, a hindrance to the progress of park work and he drops him and then his trouble is on, for it is a notorious fact that the less a man is worth, the louder he will holler and the more noise he will make when he is dropped, because he has been noticed by a city father or a commissioner, when, God bless him, he could not or would not do a day's work in a whole week. Some of the commissioners understand this, while a few others, having always been engaged at other business than moulding, planting and beautifying the earth, do not stop to think that there is no need of or that it is a shameful waste of money to pay these men for watching the grass grow, to sit on benches to keep them from jumping out of the ground, to play peek-a-boo with visitors or to keep a willing man from doing a good work by his ever present pessimistic blab. This class of would be recipients from the park pay-roll could be named, but the language to use in doing so would not look well in print—well that is enough of him.

The superintendent should always have a good word for the man that does well, and the better he does and the more solicitous

he is in the welfare and advancement of his work, the more praise he should get.

The great majority of the general public is always in sympathy with the superintendent, both in giving and asking for advice and sometimes hundreds of questions will be asked in a day concerning pests, lawns, trees, shrubs or something pertaining thereto.

Occasionally, but very rare, there will from this great public, bob up a pessimistic little ——— (put your own construction on this blank) who has managed to live in spite of the fool killer, to inject dirty politics or some unworthy selfish matter into your department. As soon as discovered he should be as Bro. Wirth wrote in one of the bulletins a long time ago, hit a good hard one for fair and put out of business for all time.

It is the duty of a superintendent to know as far as possible the soils and composition of earth in his parks. He should know the trees, shrubs and vegetable matter growing in his parks and in the introduction of any new shrub or tree, he should know what soil they require and situation to be in harmony with their surroundings.

If there be no forester, the superintendent should see to it that several of his brightest men should know how to trim and prepare the roots as well as the tops of a tree for planting, how to plant and care for it afterward. I have seen men who thought they knew it all plant out in the fall of the year *Liriodendrons* in a fair depth of soil on a gravelly knoll—they did not grow. Again I have seen men of modest pretensions take trees of the same family, trim them well down and plant them in the springtime in very thin soil, over a springy clayey sub-soil and they grew luxuriantly. Thousands upon thousands of *Rhododendrons* and *Kalmias* have been killed because they were not placed in proper soil or in a congenial situation, where if the soil could have contained a little less lime and the location a northern and of sparse shade with humidity in the atmosphere and protected from the midday sun of summer and more particularly of winter these evergreen shrubs must grow and be a joy for many years.

The superintendent should have as few rules as possible. The first one and it should be enforced. (1) Any man under the influence of liquor during working hours will be discharged. (2) Any man talking or meddling with politics should get the same dose. (3) All men must work full eight hours for a day's pay. I believe these three rules cover all the ground and have proven satisfactory in the departments using them.

Of the thousands of children that come to the parks, the superintendent should have the good will of every one of them and he should instruct all his men to keep a sharp lookout to see that the weaker ones have their chance to be merry, and to secure to them all necessary protection.

"Hello, Hello,"

CHAS. E. KEITH,
Supt. of Parks.

Bridgeport, Conn.

As to the qualifications required for a park superintendent, I may state the following, among others, viz:

He should be an engineer, a landscape gardener, a botanist and should especially be the best tempered man on earth, owing to the fact that some classes of the public seem to make it a duty to destroy everything as done.

JOHN HENDERSON,
Superintendent of Mount-Royal Park.

Montreal, Can., May, 1909.

EXTRACT FROM BY-LAWS OF PARKS BOARD.

"The superintendent shall have supervision of and be responsible for, the laying out, management, and improvement of the several parks, squares, avenues, drives, and boulevards, and the several buildings and erections thereon. To appoint, supervise, control, or dismiss, all foremen, inspectors, laborers, or mechanics, employed upon, or in, any work under the control of the Board.

To submit a monthly report to the board, upon all works in progress.

To submit annually, a summary of work carried out during the year, with recommendations for the future."

It seems to me hardly possible to write on this subject, without getting off it, to use an Irishism, for one seems to slide at once into "The qualifications necessary to fit the park superintendent for his duties," and these would fit a man for almost any position of responsibility.

The park superintendent is responsible to the board for all expenditures, therefore it is his duty to plan wisely, organize his staff, efficiently, be it large or small, conduct work systematically, encourage good, and dismiss incompetent subordinates, without fear or favour, be diplomatic with both his board and the public, be able to grasp large problems, and also have an eye for detail in all of the many branches of the work he supervises.

There are many duties outside of those prescribed by custom and by-law, which every man who is heart and soul a lover of nature and his work, will create for himself.

G. CHAMPION,
Supt. of Parks.

Winnipeg, Canada.

Park Music

Paper read at the Annual Convention of Park Superintendents, held at Toronto, Can., Aug. 15, 1907.

I have often thought, of late years, that park work would at times become almost monotonous if same required only the attention and skill to make parks attractive and keep them in good trim. Yet it was, more or less, with such a confined idea of duty and requirement, that I assumed the administrative burdens of my first appointment as Park Superintendent.

I entered that service as a landscape gardener. To-day, I proudly claim to be more, because I have found out that our parks must be more than only beauty spots in order to accomplish all the good they can in public life. I am finding, almost daily, new fields and openings for useful, beneficial service to the public, outside of the gardening profession, and all those innovations into the original plans and ideas of park work and park life, do not interfere nor mar the beauty of the original picture and its conception, but on the contrary, in most cases they enhance the beauty of same, and in all they many-fold increase the value of the work as a whole.

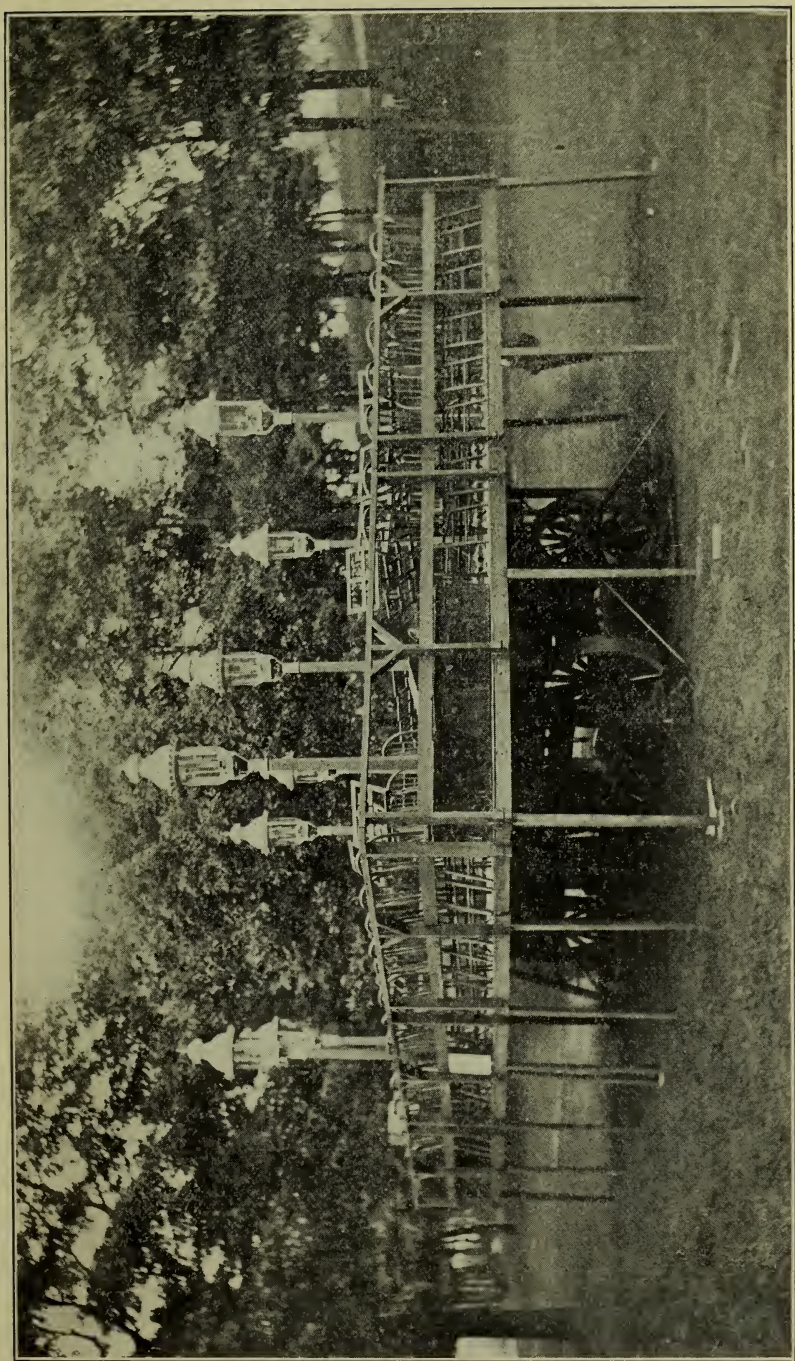
Some twenty-five years ago, one of the leading park builders of the west, was engaged in designing a park system for a very promising growing city, and in reading his report outlining the plans he then submitted, one can readily see that outside of the desire to preserve natural scenery and create additional beauty spots, the full, far-reaching value of parks as recreation grounds was at that time not fully recognized, or at least did not receive due consideration. Let me quote him as follows:

"I strongly recommend an extended system of boulevards or ornamental avenues, rather than a series of detached open areas of public squares. The latter are certainly desirable and always form attractive features, but they are comparatively local in their character, and fail to impart such dignity and beauty as is conferred by a grand ornamental avenue, comprising a continual succession of pretty gardens enlivened by the constant passing of throngs of pedestrians and fine equipages."

Now this man, at his time, was up-to-date, and the sentiment and opinion expressed in those few lines, show, if I interpret them right, a certain limit of the purpose and usefulness of parks, which in the last ten or fifteen years has almost everywhere been happily overstepped and widened. The local district or neighborhood park, whatever we may call same, has come to the foreground as a most important factor to any complete park system.

New cities in planning their systems give them from the beginning due consideration and thought, while older cities spend enormous sums to acquire comparatively small tracts of land for this very purpose and need, which, although always in existence, has been clearly underestimated if it has not been totally unrecognized.

The by far largest percentage of those neighborhood parks are or should be located in those parts of our cities where the population is or will become the most congested, and consequently they are the recreation grounds of the people who need them the most. Large parks are all right, but unless they are within easy reach of the poorer classes, they will be comparatively little benefited by them. Twenty-five or fifty cents are soon spent for car fare alone by even a small family for occasional visits, while they ought to be able to



Portable Band Wagon (Erected).

get the benefit of such a breathing spot at no cost, and at all times within easy walking distance.

The up-to-date neighborhood park of to-day embraces more than well kept lawns, attractive flower-beds, screening shrubbery plantations, shady-walks and rest-inviting settees. One of the most useful innovations are the playgrounds, in and outdoor gymnasiums, wading and swimming pools, etc., and in some systems of our larger cities, we find libraries, reading, club and meeting rooms, indoor swimming pools, baths and shower baths, etc., and the regularity with which they are visited by numberless thousands the year in and out, since their inauguration, shows convincingly that they fill a pressing demand and receive thankful appreciation.

The larger parks of most cities are equipped with bandstands, and concerts are given at frequent intervals, if not every day during the summer season. Those concerts ought to be free to everyone everywhere, but I want to go further than that and say that such concerts ought to be given at such neighborhood parks as often as possible. Of course it will be impossible, and it is by no means necessary, that such concerts be given every night, but if they could be had one a week or so, it would give a lot of pleasure and untold happiness to a class of people who have not the time nor the means to attend such concerts in parks far from their homes.

Such musical entertainment brings together all the families of entire neighborhoods. They will come, young and old, and they will feel that in their neighborhood park, they have an institution that is worthy of their appreciation, support and care. They will look forward to those concerts as a large, joyful family gathering and they will go home each time happier and elated, because we all are susceptible to the tender, inspiring influence of music and forget, under same, our cares and worries, and become happy and joyful.

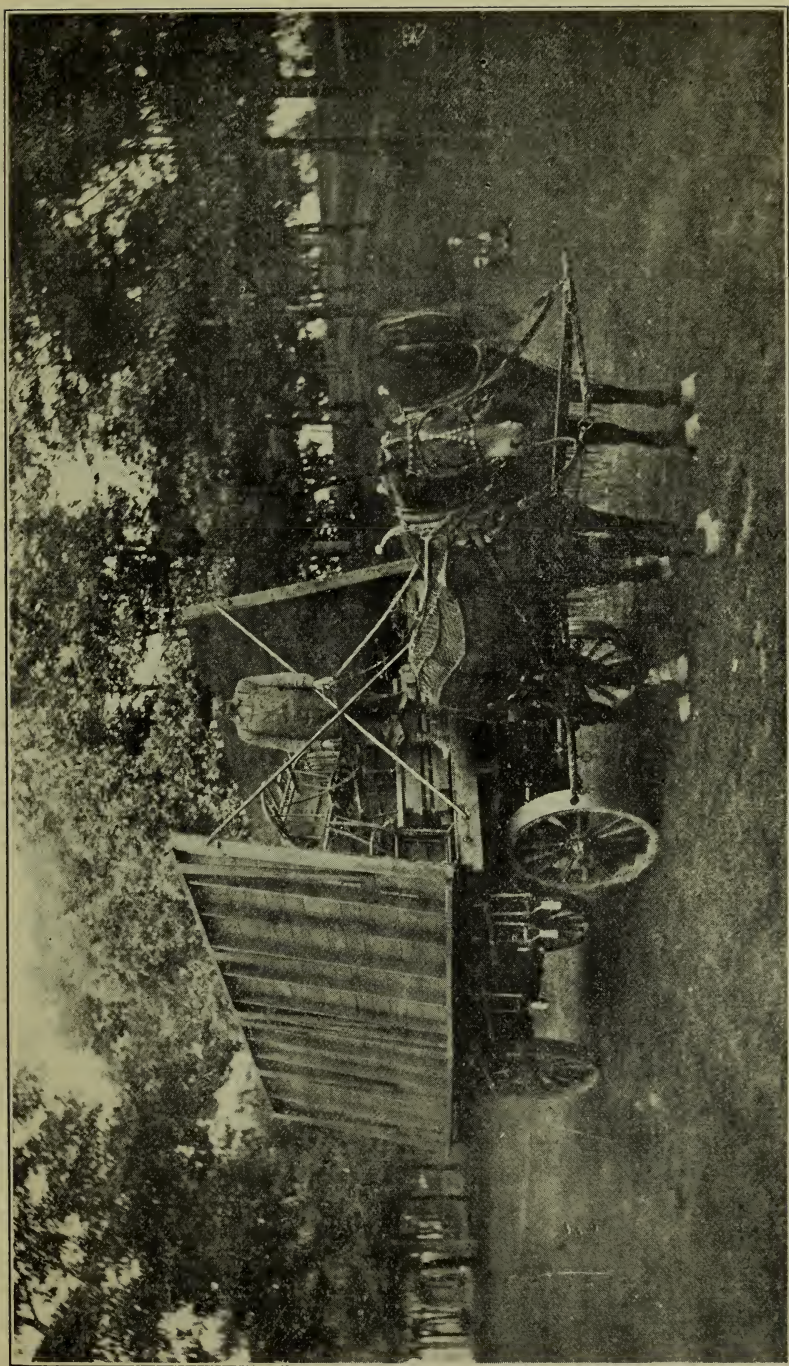
It will bring the love for music to every home and make them happier; it will mean musical education for the masses for the love of music itself.

Such concerts in local parks do not call for an extra large expense, for it is not necessary that each park be equipped with a costly bandstand, in fact such structures may well be avoided, for they are, under the very best conditions, no ornament to any park. The main thing is a well organized band of good musicians who are willing to play wherever the bandstand is erected. The latter can be moved from park to park, and need not be very cumbersome.

We have tried the experiment of such free concerts in our small parks in Minneapolis this season, and the success with which they have been conducted and the popular appreciation they have met with, induced me to say a few words about them at this meeting. We have constructed a bandwagon which can be folded together and be set up by three or four men in a very short time. The stand is brought to the park an hour or so before concert time, and immediately afterwards is folded together and taken to the barns to be used again at the next occasion at another park. The stand is on wheels and is 20 by 30 feet, and accommodates a band of 45 musicians, with plenty of room to spare. The platform is 5 feet above ground, has a railing and is equipped with 8 gasoline lamps of the ordinary gravity system. Lamps, chairs, music-stands, the large musical instruments, in fact the whole paraphernalia, is easily accommodated inside the wagon after the sides are folded up, and one team of horses will bring same wherever wanted. The whole outfit cost less than \$300.00 and answers the purpose as well as a \$5,000.00 structure.

As already stated we have met with so much success with our free concerts, that I cannot help but recommend to you fellow parkmen to do something similar, if you have not already worked along the same lines.

One of the requirements of our many sided profession, is to



Portable Band Wagon (In Transit).

anticipate and meet the desires, needs and expectations of the public. It calls for study and observation and an ever ready spirit to meet and solve questions, which in their variations, are very interesting and fascinating.

Besides the love for all that is beautiful in parks and park work, I know of no other pleasure that to me is so genuine, as is the one to give pleasure to others, and the more the better.

Permit me to quote the following letter received from Mr. Henderson, our manager of these concerts:

"Referring to our recent conversation regarding the park concerts given this summer by the Minneapolis Park Band, let me say that I think nothing has been done by the park board, since the establishment of the parks themselves, that has been of greater benefit or a source of greater enjoyment to the Minneapolis people, than the free concerts given by the band in the various parks during the last eight weeks.

It has been a constant pleasure to me to observe the enthusiastic enjoyment of the music by the thousands who have attended every concert. This is particularly true of those given in outlying parks, in parts of the city remote from its center of entertainment, populated by people whose income will not permit the expenditure of much money for amusement, and whose undirected tastes would lead them to spend what little they might afford on entertainments of mediocre if not of debasing quality.

The free concerts have temporarily depopulated the neighborhoods in which they were given. Everyone came to the park to hear the band—fathers and mothers, grandfathers and grandmothers, young men with their sweethearts and innumerable children in assorted sizes. Their attention to the music was closer than that of the more cultivated audiences at Lake Harriet, their applause more enthusiastic and their pleasure franker and more apparent. Sordid cares were forgotten under the spell of outdoor music on a summer night. The programs have been of standard and light music and many of the standard works have proved themselves favorites.

The chief purpose of the concerts, of course, has been to impart pleasures, and in this alone they have repaid over and over again the expense of giving them. They will have, furthermore, two secondary or future effects, which cannot be calculated, but which may be considered as interest on investment. One of these is their educational and refining influence, and the other is the popularizing of the parks by bringing to many people a first realization of their beauty and of their resources as places of recreation."

Park Statistics

Paper Read at the Annual Convention of Park Superintendents Held at Washington, D. C., June 13, 1906, by Geo. A. Parker, Supt. of Parks, Hartford Conn.

Our president has asked me to discuss what assistance our United States Census Bureau or some department of our national government could be to municipal park work. I do so gladly, believing it lies in its power to be an immense help in our work, for it seems certain that nothing short of a national vision is able to take in the work as a whole and bring to it that unity, simplicity and character upon which it depends in order to produce those beneficial results which it is capable of doing.

The indications are that within a generation or so about one-half of the nation's children will be born and brought up under urban conditions and that the city must depend upon its own children to an ever increasing extent to manage its own affairs, that it will be impossible for the country to furnish a sufficient number of young men and women for the cities' needs, as it has been able to do in the past. It, therefore, becomes imperative that city conditions be such that children city born and bred shall have an environment which will enable them to grow into healthy and vigorous men and women, physically, mentally, morally and spiritually, and the function which is to have a most important bearing upon this work is the park. The need is great, the result to be accomplished worthy of the nation's best effort, and conditions are such that nothing short of a national work can bring it about. A city, no matter how great, is but a small factor in the question as a whole. It would also require an expenditure of money in a way that city charters do not provide for. A state is too local to take up the question as a whole. The nation is the smallest unit that can successfully do this work, for it means the study of a world-wide problem, a study of what other countries are doing as well as our own.

The Census Bureau is already doing a very good work in giving out such information as can be obtained from inquiries and examinations of records at the city hall. To each city of over 25,000 population an agent is sent with a series of questions relating to municipal affairs, and in that list of questions are several most valuable ones relating to parks; as far as information is obtainable at the city halls of our cities, these special agents secure it along with the information relating to other municipal functions, and a most valuable mass of statistics has been sent out since Congress passed the act authorizing it some eight years ago.

At first thought it might seem that this is all that would be needed and that parks are as well provided for in this respect as our streets, sewers, lighting, policing, schools, libraries, etc., and that we have no reason to seek further, but park conditions differ from other functions. The others which are of equal or of apparently more importance have had the thought and experience of the best minds for several generations, or they have offered such a promising field for personal gain that they have attracted to them the best energies of many men of ability, as is well illustrated by the introduction of electricity. Parks, on the contrary, while of as much importance as the most important city functions, have not yet received the accumulated wisdom of several generations of experience, nor have they attracted that thought which comes so promptly where there is an opportunity for personal gain, for the possibilities of great gain in park work do not exist, and, therefore, men of great ability, in the full vigor of their lives, have not the stimulus

to engage in this work. True, men of the greatest capacity and from the best motives have devoted years of time to the work, but usually in a philanthropic way, with other interests sharing their thoughts and time. Great and good results have been accomplished by them, but that hard and vigorous, positive knowledge of what is best for a city as to its parks or how to best construct them and manage them does not exist.

We lack woefully positive knowledge as to the relationship of park areas and what they should do for the people. There has been much discussion and many suppositions have been brought forward as to what different people have thought this relationship ought to be, but positive knowledge is wanting, and none realize this fact more than those who have studied the question most. Unfortunately, parks have been considered as a sort of a luxury, as a womanish, childish affair, somewhat unnecessary and yet well enough to have, but which could be dispensed with without great detriment. This feeling towards the parks is fast changing and they are being recognized as a necessity, and their function as one of the greatest importance; yet conditions are such that they offer no inducement for speculative enterprise as a private business proposition. They offer but little inducement in the way of returns for time and energy spent. Salaries are low and bring poorer returns than can be obtained for the same amount of superior efficiency elsewhere, and, therefore, many times men are employed who are not able to fill the requirements, and this, of course, means slow progress, gives a false light and a great loss to the city. How great this loss is few people realize.

It takes more than a house to make a home. It takes more than a piece of land for a park to fulfill its function in municipal life. Primarily, a park is not a lot of open land within a city. It is the people who use the land that constitute the park and not the land they use, just as it is the people who live in the city that make the city and not the buildings and streets. New York would not be a city if every human being was to leave it; it would be but a city corpse. Not that a city can exist without buildings, but I want to emphasize the fact that the buildings are the shell and the people are the city and that the park, unless used, is a dead thing and not in its primary sense a park at all, no matter how divinely beautiful it may have been made.

A park is land within a city where people may have the freedom and influence of the country.

I want to establish another viewpoint of parks than by the acre. For several years I have tried earnestly to solve the park problem by acreage, to determine what acres might provide. Apparently the strongest attractions for the great mass of people in our cities are other people, and the outdoor places frequented the most are the streets, but the street is purely urban, with an artificial floor and artificial sides. True, overhead there is the sky, ever beautiful and ever changing, but the range of sight seldom goes above the second story.

Now, if urban scenes and influences can make that which is best of the human body, mind, and heart, then the whole problem might be solved by widening our streets into promenades, but experience has proven in the past, and it probably will remain true in the future, that purely urban conditions cannot produce that which is best in mankind; that only through country freedom and country influences can the best in him be developed. Therefore, parks are absolutely essential to city life, if those who are born and bred in the city are to be kept from degenerating.

It has become so unsatisfactory to me to say that a park system consists of so many acres and has such a ratio of area to population or valuation, and has cost such an amount, and has such a rank when compared with other cities, that I want to set up another

yardstick to measure our parks by, especially as I believe it is a better one. It is not of so much importance whether we are doing more or less than some other cities; the important matter is what we are actually doing for our own people. It is much better, it seems to me, to range up our parks measured by what they supply to the people who use them rather than by acres and cost.

The Census Bureau is already giving us what we can reasonably expect regarding park areas, yearly expenses, etc. Its work along these lines seems quite satisfactory, but that is measuring parks by the low standard of physical relationship. What I would like to see in addition to what is now being done, would be to have them measured by what they are giving, or are prepared to furnish to the people, and what use the people make of them. This information would be of much greater value than that of area and cost, and I believe it could be obtained after a few years of experience by the Census Bureau, or by some department of the government.

There are difficulties to be overcome, but none of them unsurmountable. The data for such statements do not now exist. No special agent of the government can go from city to city and find these data already prepared and in shape for tabulation, for they do not exist in any record in any city and are not known by any person, but the facts, nevertheless, do exist, and although unknown, are not unknowable. They can be learned, but only by those persons who are well acquainted with municipal conditions, who can interpret what they find as they go from city to city, who can read, first hand, from the park area itself the story which it is telling to the people it serves. At present I believe it is only possible to obtain this knowledge, which is so much needed, by an actual observation of actual conditions. It cannot be known by securing answers to any series of questions that can be devised or asked of any park employee, or person interested in parks; for, however well they may know their own local condition, yet at best it is only local and not general principles that are evolved from one example—for, as a man cannot become a good judge of cattle by milking one cow, so a man cannot learn all there is to be known about parks, if his interest is localized in the parks of his own city. To know parks he must go from city to city to see parks on parks, study them, interpret them, know them by heart and love them. Only in such manner can the knowledge be obtained, digested and sent forth upon its mission, perhaps as a special bulletin or a series of bulletins.

This, then, is what I would like to have the national government do in addition to furnishing the statistics it is now sending out: to find some person with a practical park experience, who knows parks and loves them, and who knows municipal affairs and the province of the different city functions, who knows the people and is in sympathy with that great majority in all cities—the common people, who knows trees and plants as a father knows his children, who can interpret lines, surfaces, forms and colors, and the influence they have on the human mind and heart, a man who is capable, if it was known, of understanding and appreciating all that parks may mean to a city, and when it has found such a man, to send him forth to learn the lesson of the parks, to write it out step by step and publish it for our people.

Would they be justified in doing this? I think so, for already one-third of our people live under urban conditions, and every one of them so living is influenced by the correct solution of this problem, and what helps the people is surely no small matter. If the only question was the saving of dollars and cents it would pay a thousand times over, for about twelve million dollars are now annually expended in park work, and this knowledge would enable that money to do twice as much good as it does now. The interest involved is, therefore, large enough to justify the work.

PARK STATISTICS.

All for Year 1909, Except Winnipeg, 1908.

Data obtained by a postal card canvass. Two hundred and fifty cities addressed. Canvass conducted by the Secretary-Treasurer.

CITY.

	Population.	Population per acre.	Acreage.	Maintenance per annum.	Maintenance per acre.	Maintenance per capita.
Hamilton, Can.,	72,000	480	150	\$20,000	\$133 33	\$0.277
Toronto, Can.,	330,000	270	1,222	150,000	122 74	.454
Winnipeg, Can.,	130,000	261	498	23,355	46 89	.179
Pomona, Cal.,	12,000	266	45	1,300	28 00	.10
Pasadena, Cal.,	32,000	2,285	14	8,880	634 28	.27
Colorado Springs, Col.,	40,000	19	2,536	.....	.....	.....
Pueblo, Col.,	50,000	187	266	31,500	118 43	.63
Bridgeport, Conn.,	110,000	275	400	25,000	62 50	.227
Naugatuck, Conn.,	14,000	233	60*	1,300	21 67	.093
New Haven, Conn.,	135,000	132	1,017	30,000	29 49	.222
New London, Conn.,	20,000	488	41	5,000	121 95	.25
Waterbury, Conn.,	70,000	875	80	12,750	159 37	.18
Washington, D. C.,	343,003	363	943	333,000	353 03	.97
Macon, Ga.,	43,000	860	50	1,840	36 80	.043
Savannah, Ga.,	85,000	485	175	2,000	11 43	.023
Decatur, Ill.,	30,000	434	69	3,000	43 48	.10
Peoria, Ill.,	75,000	179	420	80,000	190 47	1.06
Rock Island, Ill.,	100	250	100	10,000	100 00	.40
Springfield, Ill.,	60,000	95	630	40,000	63 50	.666
Streator, Ill.,	18,000	1,384	13	1,500	115 38	.083
Fort Wayne, Ind.,	75,000	500	150	17,000	113 33	.227
South Bend, Ind.,	65,000	342	190	18,000	94 47	.277
Cedar Rapids, Ia.,	32,000	188	170	12,000	70 59	.375

PARK STATISTICS—Continued.

CITY.

	Population.	Population per acre.	Acreage.	Maintenance per annum.	Maintenance per acre.	Maintenance per capita.
Paterson, N. J., ...	120,000	1,200	100	22,500	225 00	.187
Hornell, N. Y., ...	16,000	615	26	250	9 61	.015
Jamestown, N. Y., ...	23,000	2,555	90	4,000	44 44	.174
New Rochelle, N. Y., ...	25,000	2,273	11	7,500	681 81	.30
New York, Brooklyn and Queens, ...	1,700,000	952	1,785	1,039,491	582 34	.611
Utica, N. Y., ...	70,000	128	544	8,051	14 80	.115
Watertown, N. Y., ...	30,000	85	350	.....	.....	.....
Fargo, N. D., ...	15,000	333	45	3,500	77 77	.23
Mansfield, O., ...	30,000	150	200	.....	.....	.....
Marietta, O., ...	15,000	600	25	1,500	60 00	.10
Toledo, O., ...	185,000	200	925	85,000	91 89	.454
Portland, Ore., ...	250,000	500	500	109,000	218 00	.436
Chester, Pa., ...	40,000	500	80	4,000	50 00	.10
Harrisburg, Pa., ...	75,000	100	748	27,985	37 41	.373
Philadelphia, Pa., ...	1,500,596	418	3,583	.....	.....	.....
Pittsburg, Pa., ...	650,000	496	1,310	300,000	229 00	.46
Reading, Pa., ...	95,000	467	203	12,500	61 57	.131
Scranton, Pa., ...	130,000	1,215	107	5,612	52 45	.043
Sioux Falls, S. D., ...	16,000	640	25	3,200	28 00	.20
San Antonio, Tex., ...	120,000	300	400	18,000	45 00	.15
Ogden, Utah, ...	34,000	850	40	.....	.....	.....
Seattle, Wash., ...	309,375	408	757	82,172	108 55	.265
Tacoma, Wash., ...	150,000	200	751	45,000	59 92	.30
Total, ...	12,304,408	264	46,447	.....	.....	.....
Total omitting cities without maintenance report, ...	9,072,812	35,191	35,191	3,825,445	\$108 63	\$0.422

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OF

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PARKS—EAST AND WEST

Development of Washington Park

*(A paper read by Wm. S. Egerton, Supt. of Parks, Albany, N. Y.,
at the annual meeting in Albany, 1903)*

In 1869 a law was passed entitled "An act in relation to a public park in the city of Albany," the area of the same extending over the Washington parade ground, the old State street burial grounds, the almshouse farm, and the penitentiary grounds, with such other property as might be acquired by purchase or otherwise.

Washington square, or the parade ground, situated between State street, Madison avenue, Willett and Knox streets, ceded to the Commissioners by the law referred to, was duly considered in the plan for a new park, and grounds were broken early in July, 1870 for its improvement.

The State street burying grounds were at this period surrounded by a common fence about 10 feet high. Each congregation had its own gate for its funerals and high steps on either side of the fence permitted egress and ingress to occasional visitors. In the earlier days these grounds were well kept, but the Rural cemetery took away all the poetry from the willows and the elms and consigned it to the Troy road. There was a mouldy and neglected air about the place. The bodies had been removed to the Rural cemetery, and the grounds subsequently were trespassed upon by vicious idlers.

From topographical maps prepared at this time, a plan for the extension of the park over the area of the burial grounds and up the valley now occupied by the lake in Washington Park was submitted by Messrs. Bogart & Cuyler, at that time employed as landscape architects of the Board of Park Commissioners, named in the original act of May 5, 1869.

Subsequent purchases of contiguous real estate enabled the board yearly to add to its area and to remove unsightly objects from the immediate surroundings of the portions improved.

This system of intermittent purchases and acquisition of contiguous property was found to be expensive and unsatisfactory, as values were enhanced by the successive improvements made and property owners were not to be cajoled or frightened into selling their property by increased assessed valuations or cumulative taxes. Each acquisition of new territory necessitated some modification of portions of the park area already defined and still further advanced the value of lands ultimately found necessary to be taken for park purposes.

The narrow scope of the original design is made conspicuously apparent when compared with that of the completed park. Even this is marred by the lack of symmetry and the private properties surrounded almost entirely by the park improvement. Taken as a whole, however, Washington Park is unique in design, central in location, harmonious and natural in its treatment, and well deserving the many encomiums it receives.

The fundamental elements of any large park are not its roads, walks, bridges, buildings and other accessory features requisite for the public accommodation and the use of the grounds. These may rather be classed as necessary evils. The essential element is the landscape; its surface undulations of hill and dale or lawn; its trees, shrubs, flowers, single or in mass, in grove or copse; its deep woods or open glades, and its broad stretches of green sward or water. All of these in their endless combinations are constantly

modified by the varying conditions of the point of view, the atmosphere and the seasons. Many visitors, however, because they happen to have little knowledge of individual trees or shrubs, or little taste for landscape beauty, take in like proportion little notice of the ever fresh, ever changing features of the verdant landscape, and enjoy chiefly the accessory works of mechanical construction; but the true ideal of park recreation to persons worn by the harrassing turmoil of city life is the refreshing enjoyment of all that is beautiful and blissful that may be seen and felt amid the serene manifestations of nature embodied in the scene.

It cannot but be interesting to devise and watch the gradual development of a landscape, very much as the artist paints a picture. First, the groundwork and the constructive features, to be followed by the details of the ornamentation. The artist must have a true conception of the subject he wishes to portray. He does not start in a haphazard manner, hoping something artistic may develop as he advances with his work; but a well-defined idea must be conceived at the start of the general effect to result from the many combinations of design and color.

When this idea is conceived and well established by a complete design, a park is not to be made in a month or in a year. Nature cannot be forced, but only assisted in the development of the somewhat complicated mantle she assumes.

It is this progressive work that pleases and affords the interest and charm to the landscape architect and park superintendent. Nature responds so generously when she is understood, and the more intimate one becomes with her laws the closer become the ties that bind one to her.

It is a pleasure to plant and see the trees, shrubs, and flowers develop with a continuous and intelligent oversight; to anticipate the requirements of the season and the resultant needs of the many growths, ranging from the hardy to the exotic plants; to see daily results of your care developed with the advancing season, and know that thousands are enjoying the results of your labor, in addition to the pleasure you may derive from it yourself.

It is a pity that all individual effort in the many channels of life does not receive such a responsive throb as nature bestows to repay one beyond the measure of a pecuniary recompense. Washington Park has proved a healthful, vitalizing force to the people of the city, and its worth cannot be estimated pecuniarily; its uses stimulate the energies and quicken the pulses of thousands; its pervasive influence elevates the moral tone of the community, and its great mission is only entered upon and will be continuous.

Washington, D. C.

*(A paper read by Geo. H. Brown at the Eight Annual Convention,
held in Washington, June, 1906)*

The first steps for the creation of parks in the city of Washington were taken by A. J. Downing early in 1851. Prior to that time no practical improvement of our public spaces—so called—had been undertaken. Under his general direction Lafayette Park was laid out and improved and planted, and what is now the central portion of the Smithsonian Park was laid out and planted. His untimely death in 1852 resulted in the failure to complete these grounds and also to carry forward projected plans formulated by him for the other public spaces of the Mall now comprised in the chain of parks from Third street to the Potomac River.

The work done in this very brief period under Mr. Downing's direction was well performed, and together with his published writings later, exerted a most beneficial influence throughout the country at large in the matter of landscape gardening and resulted in many of our large cities undertaking the work of creating parks within their limits that required expenditures of millions of dollars. For more than a decade following Mr. Downing's death few improvements of a marked character were made in the government reservations at Washington—the exceptions being the U. S. Botanical Garden, under our venerated Wm. R. Smith; the Propagating Garden of the then Agricultural Bureau of the Interior Department, under my direction until the outbreak of the Civil War, and the present park of

the Agricultural Department grounds, under the direction of the late Wm. Saunders, so well and favorably known to many of us. In 1867 the control of the public grounds, with the exception of the Capitol Park, the Botanical Gardens, and the Agricultural Department Park, was transferred by Congress to the Chief of Engineers of the U. S. Army, and from that period to the present time their continued improvement has been under the supervision of officers of the Engineer Corps detailed for that purpose by the Chief of Engineers of the U. S. Army.

At the present time the total number of parks and small parklets is about 310, and their aggregate area—including Potomac Park, now in progress of improvement—over 500 acres. The majority of them are small parklets widely distributed within the so-called old city limits and it requires a good day's journey with a fair traveling roadster to visit all of them. Outside the old city limits the chief parks are the Zoological Park, comprising 170 acres, under the control of the Secretary of the Smithsonian Institution; the Rock Creek Park, 1,600 acres, under the control of the Commissioners of the District of Columbia, and the Soldiers' Home Park, under the control of a governor, usually a general of the U. S. Army, retired. The city of Washington has been often referred to by newspaper writers and others as a unique city, differing from all others in many features—chiefly its magnificent public buildings, its broad avenues diagonally bisecting it, and its well-paved streets lined with tree growth and its apparently numberless small plots of grass, shrubs and flowers at intersections of these avenues, forming a wealth of verdure to relieve the sight of poor city folks from the everlasting contemplation of brick and stone surroundings. One prominent writer describes it as the city of the winter and spring time, and says a curious spell rests upon it in the summer months. In October and November the people who disappeared in May and June flock back as if by magic—houses are opened showing brightness within, the stores are crowded and the hotels assume a stirring activity.

But it is not these aspects of our Washington that interest us most. We would like to see our park systems amplified and extended to both sides of the Potomac River and many of the beauty spots of its encircling hills and valleys set aside for parks and park places for public resort—to relieve the pressure of life's work and varied duties in this, our chief city of the nation, the future of which it is impossible to predict. Our mutual friend, Mr. W. R. Smith, and myself, hardly any longer young men, have seen marvelous changes here during the last half century, and now the wheels of progress in all directions are moving very rapidly along. What will be the outcome a half-century hence? Who will dare to say?

Washington, D. C., June, 1906.

Seattle, Washington

Seattle is built on a hill, and is sand, gravel and hardpan. Occasionally blue clay is found. There are two large parks here—Washington, containing 120 acres, and Woodland Park, containing 174 acres. Besides this there are numerous small parks, small squares, and they are now acquiring property for playgrounds. Woodland Park is on the shores of Green Lake, a small body of water about four miles and a half from the center of the city. The trolley car passes direct through the center of the park on an elevated trestle. This park is very popular with the masses. The original forest still remains, and to an Eastern man the large trees are of lasting interest. This native fir (*Pseudo tsuga taxifolia*) are from 5 to 7 feet in diameter at the butt and from 100 to 150 feet in height. Interspersed with these trees are native cedar, hemlock, yew, spruce and the black alder (*Alnus argona*). This becomes quite a large tree, as we have one specimen 18 inches in diameter and very much resembling the American beech. The ground is covered with *Berberis nervosa* and *Gaulthera shaloon* and the contrast and beauty of these two plants is indescribable—both being evergreens and shade loving, give the parks a distinct charm of their own. But by far the most interesting tree is the madrona (*Arbutus menziesii*). When I reached here in May this tree was in bloom, covered with long racemes of white flowers. The bark in winter

J. W. THOMPSON.

to each other and to the shore line of Lake Michigan, located at irregular intervals from the shore of the lake westward, varying from 600 to 1,800 feet from crest to crest of the ridges. These ridges were generally about 300 feet in width and were from 4 to 8 feet at their summits above the general level of the surrounding ground. The area between the ridges was generally swampy, each succeeding swale being about one foot higher than the one next nearer the lake, the one nearest the lake being generally no higher than the water in the lake at its average stage.

The lowlands or swamps had considerable light vegetable mould—in some cases being two feet in thickness, but generally about ten inches. The ridges were formed of fine sand and gravel, the surface coated with a thin layer of vegetable mould so mixed with the gravel and sand as to be of little value for vegetation. The ridges were generally fairly well covered with a stunted growth of red and burr oak, occasionally some white oak, red maples, hickory, alder, hazel, sumach, black-haw and dogwood, with willows along the margins of the swamps. Some wild grape vine was also to be found. The swales had a rank growth of sage, rushes, cattails and flag, with yellow and white water lilies where there was sufficient water. Such was the almost barren area set aside for the parks.

Nature had produced nothing attractive. The clouds of soft coal smoke, becoming each year denser and denser, has only added to the unpropitious condition, and while we are securing some sort of results in the growth of the shrubbery and trees hardy in this latitude, still I am sure that we shall never be able to get anything like the results obtained in most other localities. Our trees do pretty well up to a certain age, varying, of course, in different varieties, but before any of them attain great size they cease to be at all thrifty, and after existing fairly for a few years cease to be beautiful, and finally, after the lopping off of branch after branch, are condemned and cut down. The evergreens will not do at all. The young Austrian pines we can keep attractive for, perhaps, five or six years, and the spruce for about three years, when they become unsightly. It is not for want of care that we suffer. The trees are well fed, mulched, and always watered when necessary, and are planted in rich vegetable mould brought in from the country.

We have so far been free from insect pests, some caterpillars and cotton scale excepted. They, of course, like death and taxes, always are to be relied upon to do their work everywhere and through all conditions.

Our parks are located in an unattractive locality. We have only one imposing natural feature—Lake Michigan, unsurpassed in its ever changing interest by few of nature's creations. But all our parks can not be on the Lake shore. The great characteristic feature of this broad land of the Illini is its great prairies, and the designers of our parks were wise in recognizing that fact in their studies, and our parks are Illinois parks—that is, gently rolling ground with low level stretches of land adjoining the water, reaching back to the small, easy elevation, practically in keeping with the general characteristic of the surrounding natural country, so that one feels when entering one of the parks that he is still in Illinois and no effort has been made to transplant him to a miniature Himalaya range of mountains or the beautiful valleys of Lombardy. But this sort of park must rely for its attractiveness on maintenance. Those who are fortunate enough to have natural elevations, winding brooks and great hills have parks that are most interesting under any conditions; but with us, if our grass becomes too long or brown, or roads or walks slightly littered with leaves or dirt, weeds in our lake, or any evidences are seen of the least neglect in our housekeeping, the attractiveness is gone and neglect is so plainly written all over the face of things that a great cry goes up from the people. So we must give much more attention to keeping things tidy than many others are required to do, or more, perhaps, than would be desirable in many other places. Too much care in a park is to me undesirable. Nature, when it will do things at all, does them well. I grieve much that we must be so awfully spick and span.

J. F. FOSTER.

February, 1905.

Lincoln Park, Chicago, Illinois

Lincoln Park, like those on the South Side, which Mr. Foster has so well described, is made on a sand dune. The native growth is chiefly black oak, but on this sand, so slightly above the water of the lake, various willows and poplars grow well and form comparatively handsome trees. Occasionally a white elm does well also, but many of these were planted without sufficient soil to make good specimens and the result is discouraging, especially since the elm scale has taken hold of the weaker ones and is now rapidly increasing. This park lies along the side of Lake Michigan for nearly three miles, like a narrow ribbon of grass and trees, between a densely populated district on the west and the lake on the east, so that it is thronged almost every day by multitudes of people who make this their playground on account of its accessibility, and also because the zoological collection here is a good one. These crowds come in such numbers that it is very difficult to keep shrubbery and grass in good order and we are continually replanting viburnum, lonicera, roses, sumach, cornus, and such very hardy plants. Owing to the severe lake winds and the poor soil very many beautiful plants, like *Cornus florida*, for example, which flourish within 20 miles west of the lake, and even on the east shore of Lake Michigan, opposite, are of no value here.

R. H. WARDER.

February, 1905.

Brooklyn, New York

The principal parks comprising the system of the Boroughs of Brooklyn and Queens, which two boroughs form the westerly end of Long Island, are located on a ridge varying in elevation from 60 to 185 feet above high water. This ridge, nearest to the north shore of the island and extending along its entire length, was originally heavily wooded. Clearings were made from time to time and the native growth was slowly disappearing when Brooklyn awoke to the necessity of a park of large area. The resultant agitation terminated in the purchase of the site now known as Prospect Park. The city's growth soon made it manifest that more parks were required, and about ten years ago the largest park in the system, Forest Park, was purchased. This park contains some very fine old trees, along with the second growth, probably from 10 to 40 years old. The trees native to our locality are the swamp oak, the common and weeping willows, the chestnut, white and black birch, the locust, hickory, pitch pine, cottonwood, tulip, and several varieties of beech. Of shrubs we find the *Berberis vulgaris*, sumac, redbud, dogwood, arbor vitae, hibiscus, and the mountain laurel; while near the seashore thrives the *Baccharis halimifolia*. We have succeeded in raising and keeping all the deciduous trees and evergreens commonly found in these latitudes, and have even succeeded in raising fine specimens of *Cedrus atlantica*, *Picea alcockiana* and the Indian cedar. All the authorities seem to agree that the above species cannot be grown successfully north of Philadelphia; nevertheless they are to be found in our parks and are in good condition.

The trees most used for street planting are the American and English elms, both varieties doing remarkably well, even near the seashore; the *Plantanus Orientalis*, which is largely used throughout the park system and does well anywhere; the Norway maple, and almost every variety of oak.

Before the street planting was turned over to the Department of Parks city streets were mostly planted with soft or silver maples. The department has eliminated this tree from its list of those available for street planting for the reason that almost every known disease to which trees are subject in this locality originate in and feeds on soft maple.

The tree insects we had most to contend with for a number of years past were the tussock moth, the elm beetle and the San Jose scale on

flowering shrubs and fruit trees. The latter we have absolutely eradicated by simply destroying the plants that were infected; the elm beetle we have almost conquered, and the damage resulting from the tussock moth has been greatly minimized. It requires, however, constant watchfulness and the thorough cleansing of the trees from time to time and the spraying of the infected trees with a poisonous mixture.

The shrubbery planted which does best in our locality consists of rhododendrons, both the maximum as well as the hybrid varieties, the *Viburnum*, *Forsythia*, *Weigelia*s, *Azalea*s, both *indica* and *amoena*; Japanese quince and hydrangeas of all varieties.

W. J. ZARTMANN.

February, 1905.

Bridgeport, Connecticut

"In looking for the acme of perfection, the hub of all creation in parks bordering the sea shore, one has to travel to Bridgeport, to our very own, our beautiful Sea Side Park; and the first exclamation that proceeds from his lips will be: 'Eureka! I have found it.'"

Comprising some 150 acres, it extends in an irregular but narrow width for 2 miles along the Sound, with a low, undulating surface, the highest point not over 15 feet above high-water mark. A sea-wall built in Portland cement has been constructed the entire length to prevent its disintegration by wave action.

The natural trees consist of several varieties of oak and hickory, ash, elm, and quite a number of our beautiful gum tree (*Nyssa sylvatica*). A large number of nursery trees have been introduced and have done very well, especially the *Tilea europia*, *Betula alba*, and the *Larix europia*. None of the *Picea* family do well, and *Abies canadensis* will not live at all. Hundreds of dollars have been spent in trying to induce that most graceful of all our evergreen trees—the hemlock, to grow on the slope facing the water, but without avail. The Austrian pine and some varieties of the Cedar family are rugged enough to withstand the quantities of saline matter that permeates the atmosphere during some storm periods. The atmosphere that invigorates and exhilarates one is, perhaps, this park's greatest charm, for when the thermometer is hovering about the 100 mark and the country is enduring its warmest period, all one has to do is to take the trolley or any other conveyance to Sea Side, inhale a little of the cool, balmy air as it is wafted to him by the prevailing winds from off the briny deep, and he involuntarily exclaims: "Surely this place is next to Heaven!"

Skipping by the numerous other parks, we will say a few words in praise of Beardsley, our beautiful inland natural park, with its rivers and lakes, its picturesque hills and crags, its rich and fertile valleys. Its exceeding large variety of native trees and shrubs places it among the foremost as a natural park.

Cornus florida abound here in large numbers, also the *Ostrya*, *Ptelia*, *Laurus*, *Robinia* and other medium-sized trees. The chestnut, beech, oak, hickories, etc., in large trees; magnificent specimens of hemlock and *Cupressus prostrata* are common, and to enumerate the shrubs we would have to mention nearly all of those that are indigenous to New England.

CHAS. E. KEITH.

February, 1905.

Keney Park, Hartford, Connecticut

As this BULLETIN seems to be statements relating to the parks under the different superintendents, I will write the following regarding Keney Park, the relations of which to the public and to the other parks of Hartford is somewhat unusual and often confused.

In 1895 the Legislature of the State incorporated the conditions of the will of the late Henry Keney into an act creating the Keney Park Trustees, under whom lands for a park were to be purchased and developed under the name of "Keney Park," when completed to be turned over to the city of Hartford as one of its public parks, to be under the care of the Park Commission and their superintendent of parks. The Keney Park System and the City Park System are, during the process of construction of the first, kept separate, for the money which supports them is derived from entirely different sources. Keney Park has not cost the city of Hartford one dollar, the entire cost being borne by the estate of Henry Keney, but this separation will only exist during the period of construction.

The design of the park was furnished by the firm of Olmstead Brothers under a five years' contract, who furnished the general plan and the detail working plans for the entire park, and while they have been departed from somewhat, yet the scheme of the park is theirs.

One power was given by the Legislature to the Keney Park Trustees, which, I understood Mr. Elliot once to say, was the first time it had ever been given to any Park Board in the United States—that of purchasing or taking more land than was actually needed for park purposes and to sell this excess so as to gain, in part, at least, the increased valuation of the abutting property for the benefit of the park; and while this power has been but little used in the present instance (not more than 30 or 40 acres will be so sold), yet it marked a beginning of a principle which has several times since then been applied in the United States and which is quite common in Europe. In fact, much of the work of beautifying the cities of Europe would have been impossible on account of cost were it not for the gain obtained from the increased valuation of abutting property when resold. It is a method which, I believe, should be given more thought in the improvement of large American cities where extensive alterations and improvements are needed to be made which were not contemplated and could not have been foreseen when the city was laid out or when the owner bought the property. There are improvements which practically change the character of the section of the city, which are made by the city and for the city as a whole, and the betterments which come from them should be received by the city as a whole; at least a reasonable share of that increase of valuation should be so distributed. It can be done without the least loss or injustice to the individual owner.

Keney Park will contain, when completed, about 600 acres of undulating ground with a difference of elevation of about 130 feet, yet which in elevation is so gradual as to give pleasant slopes. The only bit of picturesqueness in the park is the gorge. The main features of Keney Park are the woods, which cover about one-half of its territory, and the two large meadows known as the "East Open" and the "West Open." It has but little waterscape. One quite sizeable brook runs across a corner and through the gorge. Two small rivulets, one of which usually becomes quite dry in the summer, and Lake Waltermere, an artificial lake covering 110,000 square feet, completes the water scenery of the park.

The natural growth was almost entirely deciduous, consisting of oaks, maples, beech, walnuts, elms, tulips and chestnuts, the latter apparently predominating, although by count it is not the most numerous. There is an abundance of small trees and shrubs, such as *carpinus*, hop hornbeams, *sassafras*, dwarf oaks, dogwood, *viburnum*, etc.

While the natural growth is very interesting and apparently most desirable, yet a careful analysis of it, tree by tree, shows many poor specimens unworthy of permanency. Usually these inferior trees are sprout growth or have been injured by fire, and an attempt is being made to replace them in time by planting seedling trees throughout the woods which will replace the others as they are removed or die out. Some 300,000 trees and shrubs have been planted during the last eight years.

In the faraway eons of time, geologists tell us that the present site of Hartford was the bottom of a great lake, only its highest hills being above the water surface as islands. This may account for the fact that Keney Park has all the variety of textures of soil possible, from the finest clays

to the coarsest gravels. Nevertheless, most of its surface was covered with a deep, fertile loam, which has been decidedly advantageous for all planting operations as well as giving a most vigorous growth.

G. A. PARKER.

March, 1905.

Albany, New York

There are seventeen parks and places with a total area of 307 acres maintained by this department, with an additional acreage of 96 acres embraced in the driveways and boulevards outside of the park system (nine miles in length). The two large parks are the Washington (90 acres) and the Beaver (78 acres). Washington Park (the greater portion of it) was formerly a cemetery. It was within the city limits and became obnoxious to the citizens for obvious reasons. In 1869 the Legislature empowered a Park Commission named in the act to acquire the cemetery for park purposes, and the city removed all traces of the cemetery to the Rural Cemetery, situated half-way between the cities of Troy and Albany.

It was found necessary to acquire by purchase and condemnation proceedings additional contiguous lands to round out the park area to its present limits.

The topography of the Washington Park area is particularly pleasing and diversified, the lowest elevation being 78 feet above mean tide in the Hudson River, and the highest 223 feet.

That portion of the present area formerly occupied as a cemetery was generally planted with American elms, with a few ash, maple, mountain ash and spruce trees.

A comprehensive topographical map was made covering all the surface indications, and, agreeably to this, a plan was developed which preserved all the essential features of the original topography and all the trees of mature growth which are the glory of the park.

The soil found was mostly a clayey loam underlaid with yellow clay and a substratum of blue clay. The site now occupied by the lake (6 acres in area) was a drainage brook, or ditch, running through the lowest depression from west to east. On each side of the ditch was an alluvial deposit formed from the wash of the hills and the silt from farm lands and cultivated fields westward. Many thousand cubic yards of this deposit were used in surfacing the areas worked over.

Subsoil drainage was largely used in making the tenacious clays responsive to surface treatment, and a good loam as a surface application has made the vegetation in this park exceptionally luxuriant.

All trees, shrubs, etc., that are considered hardy will thrive. Where the shrubs are massed they are generally planted in dug borders. The exception to this rule are the rhododendrons, kalmias, etc. Most of the indigenous trees and shrubs are represented in the planting, and a great variety of ornamental trees and shrubs can be found within the park limits. The evergreen planting, owing to the smoke and gases of the city, has been restricted to a few of the most hardy varieties.

With the exception of the elms, maples, ash, etc., heretofore mentioned as found originally in the cemetery, all the planting has been introduced during the progress of park development.

Beaver Park (78 acres) is partially improved and much remains to be done. About 40 acres are now opened to the public.

About one-half of the park area originally lay in a depression surrounded by city streets overlooking what was called "The Dump." This portion of the park is as yet in a crude condition, awaiting the filling in process, which is nearly completed to a height that will permit of a finished surface treatment.

The problem of converting what has been a noisome, unsightly locality into a park that will be ultimately an attractive spot is one that pays the city and the park superintendent to solve.

The city develops a park on the site of a nuisance and derives compensation from the sanitary and pleasurable conditions worked out in its development.

WM. S. EGERTON.

March, 1905.

Wachusett Mountain State Reservation, Princeton, Massachusetts

As the name signifies, this is not, in a true sense, a park. It is a wild and rugged spot, being a massive pile of rocks covered in part with a heavy deposit of leaf mould, and in part with a clayey gravel. The growth is extremely varied, both trees and flowers: the trees are deciduous and coniferous and of varying ages, as the different lots which comprise the reservation were cleared at different times. Much of it is coppice and there is very little of the "prime-evil" growth left. The hardwoods are hard hit with the snow and ice pressure, and consequently there is hardly a symmetrical hardwood tree upon the mountain. Much of the hardwood growth is in a state of decline, while the few spruce that we have are located in the most exposed places, yet they thrive despite the exposure, though, of course, the growth is slow.

After a careful study of the conditions existing here, we have been forced to the conclusion that much of the hardwood growth is doomed and our path lies in reforesting the reservation (except where there are stands of thrifty hardwoods) with trees naturally adapted to the conditions here. To that end we have first to build roads making accessible our 1,500 acres, then to underplant on or near the summit with spruce (*Picea canadensis*) and on the lower slopes with pine (*Pinus strobus*). The hemlock (*Tsuga canadensis*) is starting a fine family of its own and merely needs protection. We will treat the thrifty hardwood stands as well as we can and the old, decrepit hardwoods we will clear away, and brave the criticisms of those who once learned to say, "Woodman, spare that tree," and sometime we hope to have a fine forest with pleasant drives and walks which will originate as fireguards and gradually be developed into ordinary country drives and walks.

Our highest point is 2,015 feet above sea level, and the lowest is 915 feet above sea level, thus giving a difference of elevation of 1,100 feet. Nevertheless our roads are laid out with a relatively easy grade. We have some very pretty brooks, and two small ponds like small gems in a beautiful setting.

GUY H. CHASE.

March, 1905.

Pomona, California

Pomona is doing nicely for a town of its size. We claim a population of 12,000. We now have three parks—four including a small R. R. park at the S. P. Depot. Ganesha contains 44 7-10 acres, Central 2½ acres, Lincoln, a 5-acre new park that we laid out last year and planted some trees. We are now putting in walks and lawns. This is in a new part of our town which promises to be one of our best residence districts. There was donated to the city at their last monthly board meeting another plot of ground containing three acres to be used for a park and playgrounds, and today there will be another parcel of ground, possibly two acres, to be added to Ganesha Park, used, possibly, as a sunken garden. I also have charge of the street trees, the kinds planted, the removing, and also the pruning. Since taking charge of the parks here I have laid many thousand feet of water pipes—a thing we must have in this dry country, for without water we can do nothing. I have done much additional planting, built toilets of cobblestone fitted to city requirements, built over two miles of

trail, much roadway, one fine cobblestone bridge, rustic work of wood and stone; started a small zoo, which, by the way, has created much interest. Our outdoor picnic seasons are long, last year being an exceptional one; the first picnic was held in January, the last on Christmas Day, and the first of 1911 on New Year's Day. I plan much for these occasions as in this very fact—the people's outdoor enjoyment—helps get our appropriations for park purposes. The largest day picnic for one dinner was 600, the largest supper 1,000. There was scarcely a day or an evening but what there were three or four picnic lunches. Many come in hay wagons as far as fifteen miles. We have twenty tables, part of them 3 by 16 feet, 3 by 12 feet, and a few smaller ones. Many times the tables are all full and one party has to wait for the other. On special days I let them eat on the lawns. Many societies hold outdoor meetings, bringing their lunches. Thus we try to give the people enjoyment and hope it will interest them in securing park funds. I might state we have some swings, sand boxes, see saws, one giant stride, and a wading pool for the youngsters. We have for park and street tree purposes about \$14,000 for this year. I try to keep my maintenance down to \$600 per month; the rest is used in buying plants and seeds and making improvements as we can get to them.

J. M. PAIGE.

Pomona, Cal., March, 1911.

PARK ADMINISTRATION

Having been ill the whole year, much of the time out of the city, and all the time unable to do a full day's work, I have been forced to consider certain labor conditions which had not come to me before. The work went on, as a whole, satisfactorily, the efficiency of the different foremen kept the parks up to a good standard of maintenance and caretaking, but my illness showed the weakness of the organization and led me to realize that in all park departments there should be a sufficient number of understudies so that in case a superintendent or a foreman, or a man in any position should become temporarily disabled the department itself has a man who can fill his place without friction and without disturbing the work. This does not mean an understudy for every important position, but one or more men, unattached, as it were, devoted to general or specific work, who can fill the position for the time being in one of the administrative positions.

Good general administrative ability is rather rare among park employees and should be cherished when discovered. Many times a man who is most excellent in his own special work falls down when the care of general work is placed upon him; yet this same man will do good general work if he comes into it gradually, unconsciously, as it were, and, if he shows any capacity, he should be allowed to train himself in administrative work so as to be ready in case of emergency.

G. A. PARKER,
Superintendent.

Hartford, Conn., December, 1907.

PARK SEATS

My attention was recently called to an article on park seats which appeared in the *Boston Herald*. The Malden Park Commission having tried several kinds of wooden seats and benches, found that the cost of renewal and maintenance from destruction wrought by hoodlums was so great that some sort of indestructible seat had to be devised. The following from the article mentioned in the *Herald* will show how the Malden authorities overcame the difficulty:

"Seats having been asked for in a certain open space where many had already been destroyed, the city engineer, George A. Wetherbee, designed some simple affairs of concrete, reenforced by expanded metal—uprights embedded in the ground, supporting a slab-like seat. These were made on the spot by a Boston manufacturer of artificial stone. The metal cores gave the comparatively thin sections of concrete great rigidity, making them more unbreakable than natural stone would be, while the cost of construction was very moderate. The seats have given great satisfaction, so that it is now proposed to use concrete altogether for like purposes in public grounds hereafter. Since the work was experimental, no attempt was made to give the seats artistic shape. Attractive design, however, is easily made a feature in such construction. The beautiful shapes of Greek and Roman seats of stone could be easily reproduced or followed as models, adding a new attractiveness to our public grounds. The cost would be much less than carved stone. Indeed, such work is practically as cheap as wood—much cheaper, in fact, in view of the relative durability. In our climate an objection to stone, either natural or artificial, is that it is unpleasant to sit upon except in very warm weather. The effect of the cold surface may even be serious for the health. This, however, can be overcome by superposed light slats of wood made attachable in some practical manner. If these are destroyed they can easily be replaced. Not only seats, but other fixtures for public grounds, artistically designed with decorative effect, may be made from concrete in similar fashion.

JOHN W. DUNCAN.

Boston, Mass., October, 1904.

The seats we use here are the ordinary oak slat bottom, on wrought iron back, seat bracket and leg rest combined. The lengths are 6 feet and 4 feet, the latter being, in my opinion, preferable, as most persons hunt in couples and seem to think that two are sufficient on any one seat.

The great objection to a permanent seat is that the feet wear out the grass and soil where so placed unless fastened on the edge of walks. I think the concrete idea good, at least for the seat to rest on setting bolts, so as to fasten a plank to, but would not be convenient only where they were to remain permanently.

We have the usual trouble from the hoodlums who delight in destroying and marring as much as possible.

WM. R. ADAMS.

Omaha, Nebr., March, 1905.

The most satisfactory settee I ever used was of galvanized wire, the galvanizing being done after the settee was made up. Made in this way they never rust and are the most indestructible seat I know of, unless it might be that of artificial stone described above. The seat I liked best was made in Cincinnati, Ohio. Its artistic beauty and shape was all that could be desired for durability and comfort.

WILLIAM F. GALE.

Springfield, Mass., May, 1905.

The experiences of all park superintendents in the matter of the care and distribution of park settees are alike; and the use and abuse of the park settee by a portion of the public is a common experience. It is a question of no small interest to the park authorities everywhere: "How to please and accommodate the public and at the same time to protect the furniture and park surfaces."

All park superintendents are interested in acquiring the most durable, convenient and artistic park settee. Those who frequent the parks are entitled to a clean, comfortable seat. I do not think the public are entitled to the privilege of moving a park settee at will, from the walks or designated places to obscure or secluded nooks, within the dense shrubberies, or to isolated spots of shade under the detached trees of the open lawns.

The great majority of the intelligent, well-bred public recognize these restrictions. The spooning couples and the hoodlum elements ignore them.

Rules and regulations, properly posted, and with penalties for infringement, unless backed up by an effective police supervision, are useless.

For this element the park settee should be fastened down or be too heavy to move. But this you cannot do and provide lighter seats and portable seats in addition. The Albany winter climate is severe and the public do not require seats or seating accommodations generally through the parks. Here and there, in open, sunny exposures, an occasional seat is provided during the midwinter season. The great mass of park settees are removed, repaired, repainted as to the iron work, oiled as to the hardwood slabs, and stored for the winter months.

We lose, possibly, from 50 to 75 park settees a year in this department by misuse, abuse and malicious mischief.

With thirty or more years in park administration I have come to the conclusion, not without some bitter experiences and self-control, that the fewer restrictions placed upon the public use of *urban parks particularly*, compatible with a creditable maintenance, is the desirable condition to be secured.

Better repair a little sod, replant, or mend a settee, than be in opposition to public sentiment by having too many restrictions.

Just where the line is to be drawn will only be known by your individual experience.

If the superintendent has the public with him in his desire to maintain the parks and belongings in a creditable condition to the city, he secures better results than with constant friction. As the park settees in Albany are portable, not over four feet in length, the legs and connecting rod of iron, slats back and seat of oak or ash, oiled, they are easily removed for repairs or storage.

We break up the spooning and hoodlum elements, by detailing detectives in citizens clothes at night, to patrol the parks at unexpected intervals. These men are provided with flash lanterns (electric), and a few arrests are made, which intimidates this element for a time. This procedure must be repeated at intervals during the summer season. I detail men, provided with push carts, brooms, sponges and paper pickers, to cover the most frequented parks, daily. All bird lime or filth is cleaned from the settees (if any). The detached buildings are swept and the most frequented paths broomed and cleaned of all foreign matter. Eternal vigilance is the price of a good maintenance.

The only remedy, in my mind, for the abuse or misuse of parks, is the remedial one of education.

The respect for public and private property should be taught in our public schools. Educate the children to respect each other. We have all kinds of fads springing up in our common and high schools, but this one for respect of public and private property has yet to be introduced, if it may be called a fad!

I have had the experience of children from a public school in Albany come trooping out at recess. Some with knives, girdling and barking young planted trees, and others interfering and meddling with the imple-

ments and belongings of the park employees—showing evident disregard to public property or individuals.

I have found more difficulty in restraining high school scholars, male and female, than I have the poorer children of the slums. The latter obey, generally, when spoken to; the former resent any interference with their movements or acts, when breaking the rules, or making themselves obnoxious to others frequenting the parks.

I do not approve of stone or cement seats in this climate. During the intense cold of midwinter we often have a comparatively sunshiny, warm day when we would be tempted to take a seat. I think a concrete or stone seat, under these climatic conditions, would not only be uncomfortable but dangerous to the health of any one sitting long there.

WM. S. EGERTON.

Albany, N. Y., May, 1905.

I am interested in the topic and believe the idea of using concrete to build substantial and artistic benches fashioned after the beautiful lines used by the Greeks and Romans in marble is a thoroughly practical one. I have already taken the first steps towards the construction of a sample.

I have reason to believe that if the concrete is made with fine coal cinders, instead of stone, such seats will not prove to be unpleasantly cold for the sitters, at least during the season of the growth of vegetation. I am seeking a form which will be artistic and at the same time strong in every detail, presenting neither sharp angles nor ornamentation easy to break. Such substantial seats, judiciously placed, will add interest to the landscape by contrasting agreeably with the surrounding verdure in both color and form and by the hospitality implied by their presence. Again, it is pleasant to know that the seat in our favorite nook is permanently ready to receive us and in no danger of destruction by wanton hands.

In the choice of location as well as the surroundings of such seats there is an opportunity for the cultivated taste to reveal in detail subtle beauties of landscape to many who otherwise would be blind to them, as well as to cater to those philosophic natures who seek an earthly elysium "far from the madding crowds' ignoble strife," and who find "sermons in stones, books in trees, and good in everything."

Again, the appreciative frequenters of such seats add to the attractions of a park by their very presence and by their manifestations of pleasure. I can never forget my many times delight in the long gone years at the spectacle of a white-haired, happy old man in his favorite seat under a grand old elm, in front of his life-long abode. This home was situated on a wooded eminence commanding rural charms of rare beauty and extent. He was a true lover of nature, with that rare love which embraced his fellow men as well as the life of the fields, the woods, the waters and the air; and all animated nature seemed to respond to his sympathy. On such occasions he could often be seen, with a face beaming with delight, feeding the wild birds, who, having learned to trust him, flocked about and even occasionally alighted on his hat. It was an inspiring spectacle which remains in vivid memory as if it were a happening of yesterday, and which, in all my travels in America and Europe, observing the many beautiful parks of these countries, has not been surpassed as signifying a real force between nature and humanity.

The passing of the dear old man and his bird friends has for many years deprived the scene of so much of its charm that I have been forced to realize how great a part of the pleasure of the scene was due to his presence on that seat under the old tree.

In considering this subject of seats, however, I think that it will always be desirable to have some portable benches. We have had experience with several varieties—five, I think; four of these varieties have quickly been sent to the scrap heap. Those that have been proven so perishable are all of the newer market designs. The one variety which has proved itself to be much more durable than the others is one of the older, if not the oldest, pattern, as I have used them in my own home for over thirty

years and they are still to all intents and purposes as good as new. My children and their many friends have expended their energies upon them from childhood to maturity without putting them out of service. The design is rigidly simple and very comfortable, the slatted seats and backs being slightly curved to fit the forms of the sitters. The strength is found in the weight and forms of the iron castings, the edges being heavily flanged, and the thick slats are fastened with bolts and nuts. The thread end of the bolts project beyond the nuts being carefully upset, so as to make it impossible to remove them without serious work with a file.

FREDERIC SHONNARD.

Yonkers, N. Y., May 23, 1905.

Regarding park seats, I would state that the seats should be made for the comfort of those persons who resort to these parks for rest and enjoyment, and a large proportion should be movable and stored during the winter for protection and preparation for the next season's use. The last seats purchased for use in this city were made with strap-iron frames and hard maple slats for seat and back. To protect them from hoodlum abuse we fastened the legs to wooden blocks and fastened them to iron 12-inch pins driven into the ground. By this method we have succeeded in protecting them quite properly, and by pulling up the pins we can move them to a place of storage. In Brattleboro, Vt., I once saw some solid granite blocks placed on the edge of sidewalks which answered as all-the-year-round seats, and a wooden top could be put on them for comfort; but I do not think these or any other form of seats should be used that are not comfortable and restful in use.

CHRISTOPHER CLARKE.

Newhampton, Mass., October 27, 1904.

The subject under discussion is certainly of great interest to all of us here at Keney Park. We have under construction a system of paths which will ultimately cover a territory of about 700 acres. The distance from one end of the park to the other is over three miles, and in order to make the paths attractive and for the comfort of the public, seats should be placed at different intervals. I do not like the bright red or yellow benches; they do not harmonize with the surroundings in a park like this, and in many instances will clash with flowers or shrubbery. The idea of using concrete for substantial and artistic seats is excellent. It seems to me that we also might use chestnut or oak logs—say 4 to 5 feet long and 18 inches to 2 feet in diameter, with one side flattened. They could be placed in some shady nooks along the paths and would certainly not detract from the surrounding landscape. As for durability, they should last quite a number of years. We are troubled but very little by hoodlums, and I think the system of patrolling practised in this park is responsible for this.

CARL U. FOHN.

Hartford, Conn., December, 1904.

I believe that a seat built of concrete and reinforced with steel bars would be a very durable seat and might be made fairly ornamental, but my experience has led me to believe that as the conditions change so much from year to year in park work that where a seat is required this year, perhaps the conditions might be such another year that a seat would not be needed in the same position.

I think the ordinary park seats for sale in the market at the present time are as durable and ornamental as any, if painted to harmonize with the surroundings. Artificial stone seats would be very disagreeable on a cold or damp day and must be more or less injurious to the public health. If

they are covered with slats of wood I see no reason why they would not be as easily defaced as the slats on the ordinary park seats. Most of the park seats are made with iron frames covered with wooden slats. They are very inexpensive, and if kept well painted last several years. New slats can readily be substituted if necessary. They are easy to move from place to place and can be easily anchored.

We have a great many of these seats in our city, located sometimes near the junction of streets where passengers wait for electric cars. The seats are set back near the fences and the police see that they are not occupied by loafers and that women and children have the preference of seats.

There is no reason, under the present good system of management in our parks, why the seats should be whittled, marked and defaced any more than a piece of furniture in a home, and the sooner we educate the general public up to the point that it is not necessary to build everything of stone and iron to protect it against defacement the better it will be. I believe it is better to place ordinary people on their own responsibility rather than to try to construct things that will tend to show them that we have to build everything indestructible in order to have it remain intact.

With something over twenty years' experience in cemetery work and some fifteen years' experience in park and street work, I believe in placing individual responsibility on the public and holding them up to the standard of good behavior. I notice but little disposition on the part of the public to deface property in the public parks.

CHARLES W. ROSS.

Newton, Mass., December, 1904.

There are three forms of seats in use here: for the city parks, for the use of the public generally, there is the ordinarily used park seat, about 8 feet in length, constructed with three iron castings combining base, legs, arms and back, with provision for inserting seven bevel-edged ash slats, five for the seat and two for the back. These three castings are all alike—one being placed in the center of the seat for additional strength and to prevent people from lying upon them. The castings are fastened into position by heavy screws passing through them from underneath and the back into the slat. There is one tie rod of $\frac{5}{8}$ -inch iron underneath the seat and near the ground and passing through the three castings and having a pair of heavy tie nuts at each end of casting.

These seats are constructed and painted two coats (heavy) of dark green paint by the Park Commission employees, and cost about \$6 each. In the wooded reservations there are rustic seats made from red cedar with the bark on, varying in size and form and cost, built into cedar posts planted in the ground.

There are also logs split once and smoothed up with the axe laying upon stones or timber, and the regular park seats, as first described, are used in some places, but they seem altogether out of keeping with the surroundings and they probably will be substituted by a more appropriate design but of a like character, so that they can be moved to various positions. The seats which have been most used for the longest time are the first described, and the repairs so far have been very little outside of painting. Those first constructed are now about seven years old.

The mutilation of the seats by the public in conspicuous places has been very little, but the more secluded its position the more carving there has been done upon the slats. The concrete and steel seats described in connection with this BULLETIN seem to fill a much-needed purpose and it seems as though appropriate and artistic designs can be made and that this class of seats in many positions might fill an important requirement.

WM. S. MANNING,
Superintendent of Essex County Parks.

Newark, N. J., December, 1904.

I believe it easy enough to find a serviceable and appropriate seat for city parks and the more artificial portions of a suburban one. But the problem of an appropriate seat for the sylvan portions of a park or for a large wooded reservation seems to me still unsolved. A log of wood seems to be the ideal; but it lacks a back—something the man who sits in quiet contemplation of the scenery before him feels the need of. Possibly a very thick log might be procured and hewn into so as to leave a back of considerable height. Could not a bench of some kind be made of planks planed and then allowed to become weather-stained to about the color of an old rail fence? To be sure, unpainted wood is not any too lasting, but might it not be treated with some wood preservative? The corrosive sublimate treatment is considered one of the best and leaves the wood without odor. Then, however, the question would arise—is such wood poisonous to any one who might introduce a chip from it into his mouth?

The ordinary park seat is, of course, horribly incongruous in the secluded and sylvan portions of a park, and the average so-called rustic seat is almost sure to be too violently picturesque and often a decidedly uncomfortable thing to sit upon.

In regard to the destruction of seats by hoodlums, I think that depends partly upon efficient policing and upon the public itself. If the hoodlums are determined to destroy a thing they will do it. I have known them to use dynamite. It is, perhaps, only fair to park people to say that this did not happen in a park; it was done by placing dynamite upon the top of a stone mile post at Newtonville, Mass., with the result that the top of the post was blown off.

HANS J. KOEHLER,
Forester, Essex County Parks.

Newark, N. J., January, 1905.

Bridgeport parks are furnished with a home-made seat at a moderate cost that gives very good satisfaction. Two-inch planks, 14 feet long, 1 foot wide, bolted on top of three posts that are 4 feet long, the upper foot turned; three braces placed at the proper angle, the lower end bolted to the posts, with three slats bolted to the upper end. Plant the posts in the ground so the seating surface will be just 13 inches above ground level. Give the bench two good coats of light green paint. The bench described above used to cost \$4 delivered on the ground. The smaller size, 8 feet long, with two legs, we paid \$3 for. Most all the visitors making use of these seats find them very comfortable and enjoy them to their full extent.

CHAS. E. KEITH.
Superintendent of Parks.

Bridgeport, Conn., January, 1905.

There are doubtless many places where a permanent bench of concrete and steel, as suggested, would be very appropriate. If you will pardon me for speaking locally, we have a concrete-steel pavilion where such a seat might be used. However, the ones we have—a double seat circular bench—answer very well and have never been mutilated. Again, in our stone tower and observatory an immovable seat would fit in with the general surroundings very well. I shall also probably recommend a similar seat for a downtown pavilion that we may build this summer. Outside of these there are no places in our parks where I should care to have immovable seats, and certainly not for general use. Our benches are put out some time in April, according to the weather, no effort being made to place each individual bench, but they are put out in groups of three or four dotted all over the park. The public schools in our city have a holiday the first week in May and several thousand school children with their mothers and friends throng the park, and by the time the week has passed away each bench has been located where it could do the most good, after serving its purpose in probably a dozen different places.

Again, during the early spring one will find the benches located in sunny, sheltered spots, where one has come out to read or rest and get the benefit of the sun's warmth. Later on, when the hot, sultry, August days have come around, one will see the benches grouped in some cool, shady retreat, where those who use them can get away from the heat and dust of the city.

I think it would require a greatly increased number of benches to serve the same purpose if they were permanently fastened to the ground.

Our benches are brought into the storehouse the first of December. They are then sorted and those that are in any way broken are put aside for repair. After being mended, these, together with the good ones, are painted every year. We find that on an average 10 per cent of the benches need repairs of some kind or other and that those which are too badly broken to be repaired amount to about 1 per cent of the whole.

Our benches are made with slat seats and backs on cast iron legs and cost \$2.50 each.

ALEXANDER J. TAYLOR,
Superintendent of Parks.

Wilmington, Del., January, 1905.

In our parks we have almost all movable benches. Some are of light strap-iron, but are too light for any serious use. A medium weight that we have in two styles—one of band-iron support and the other cast—are most convenient. The cast ones break some, but we have no serious difficulty. Our park being well policed, hoodlums have not bothered. We also have some very heavy benches with arms dividing them into stalls, and these we put at points from which we do not want seats to go far, as it is work for two men to move them much distance. At one of the playgrounds we have built oak benches on posts along the edge of the woods near the tennis courts and have left them unpainted for the color's sake. They have been used but one season, but are so promising that I think we shall use them near the other tennis courts and in some of the less frequented parts. From the physiological standpoint it would seem inadvisable to use the concrete very extensively unless the modification with slats were adopted.

F. L. MULFORD,
Superintendent of Parks.

Harrisburg, Pa., January, 1905.

The composite concrete seat would be all right where a permanent seat is needed, but the cost would bar it for use where the appropriation was small. In our Rollins Park of 18 acres heavy-growth timber we use a plank seat between the trees. In White Park we have two kinds of seats—one a light one with cast-iron frame and hardwood slats, the other of heavier make, of strap-iron frame and maple slats. I tried fastening them down but it was poor policy, for they would be broken loose if they wanted them moved. Now I let them place them where they choose. Usually they find the sun in cool weather and the shade in warm. I have often thought a practical seat could be made with a steel frame and a woven wire seat and back. It would dry quick after a rain and could be framed for comfort. Another good feature—it would bother the knife artists. We have no police protection in our parks, but I have had but little trouble with our seats of late years.

W. H. RICHARDSON,
Superintendent of Parks.

Concord, N. H., January, 1905.

In landscape work as in other branches of life, success is dependent upon the thorough consideration and mastering of detail. Each minor part of the great whole should be carefully worked out, and, if possible,

be perfected in itself, ever keeping it subordinate but in general harmony with that of which it is a part. The park seat, a seemingly simple thing in itself, holds a prominent place in the landscape work. In fact, it is a prime necessity; not a thing to be desired from an artistic point of view, but, like the drive and the footpath, a thing that must be tolerated, and consequently it should be related to its environment in such a way that, if possible, it will enhance rather than mar the general effect. Too little thought is often given to the design and location of the park seat. From the utilitarian point of view it should be made serviceable and restful; from the aesthetic standpoint it should be made to blend with and not to stand out in marked individuality from the rest of the landscape furniture. It is an irresistible temptation for park superintendents to purchase cheap, gaudily painted seats, and dispose of them, hit or miss, around the grounds, to be broken by frolicing youth and carved by the all too common park artist; yet, if possible, these seats are more congruous in the half-worn condition in which the second or third year finds them than at first, when their gaudy colors crash and grate against the sombre grays and greens of their surroundings. Every precaution known to the skillful designer is taken into consideration in order to make his walks, his meadows, his plantations and his waterscape meet the requirements of the style which he has adopted or the conditions which determine his methods. An artist does not stop here. If he is treating his area in a naturalistic manner he sees to it that shady nooks where nothing is to hinder, the woodbine or the wild grape is made to weave its way among the branches of an overhanging tree, under the shade of which a solid rustic bench, with perhaps a table to match, inexpensive but inviting, is constructed. Here and there beside a brook a heavy log is placed, with perhaps another skillfully arranged to form a back, or a flat stone is made to lie "just as though it had always been there." These are the seats that the public would select in preference to stiff, steel benches or Morris chairs.

In a large natural park these expedients may be resorted to often enough to supply the demand for such seats without making them obtrusive. To cover the more congested parts of the park with logs and flat stones and thus to cause it to look like a recently cleared wood lot, would obviously be bad taste. In such places good solid benches made of seasoned white oak plank, either left unpainted or painted in quiet tones, are often used in many places with success. Here, too, the ordinary cast iron frame seat is often seen, and serves its purpose admirably. A stationary seat has its disadvantages relative to the comfort of the occupant, and, I think, should be used sparingly. If his park is urban and formal, where many people have to be accommodated, the park designer should take the seat problem the more into consideration. If the seat is to be used to such an extent that it must have great solidity and strength, it may oftentimes be incorporated with the summer house or the pergola, the straight lines of which may be made to strengthen and augment the general character and design of the park as a whole.

As for the mutilation of park property by vandals—that is a problem in itself. To my mind this evil cannot be stopped by the better construction of park furniture, but can only be eliminated by stringent city ordinances and efficient patrolmen. Nothing short of a hard, steel finish on all park property, plant and mineral, would keep certain unmolested people from inscribing their names, family history, and sundry doggerel ditties on the general landscape.

M. H. WEST,
Engineer, Keney Park.

Hartford, Conn., February, 1905.

The rustic seat has its uses, but they are few. It is generally uncomfortable. Most of them I have seen look more or less neglected, though they may not have been so. Many persons hesitate to sit upon them, fearing to soil or tear their clothing. They are expensive to make, expensive to

maintain, and, as remarked before in this BULLETIN, unsightly if used in such numbers as demanded in a park largely used by the public. Along some unkept pathway through the woods a rustic seat may be placed some distance back from the path in some inviting, cool, shady nook, or under some large willow at the brook side, where any other seat would be too discordant a note in the symphony. But even here a log or thick plank supported on sections of a log is less a feature in the picture, and, therefore, better, for seats should be as inconspicuous as possible everywhere except in connection with architectural construction.

Concrete seats in places are very satisfactory. We have used them at sand pits and under stone or concrete colonnades and other places where they were not objectionable because of being placed in connection with something strikingly artificial. Placed along the ordinary walks of a park they are too hard, stiff and conspicuous to be desirable.

The common park bench, hardwood slats fastened to wire frames, is far from satisfactory in appearance where many must be used. But I know of nothing better for general use. The color should be carefully selected. The main thing is to make them as nearly invisible as possible. Where there are not many visitors to a park the benches may be safely left without fastening down. But where there is a big crowd every day and evening, if the benches are left to be moved about at will by the people using them the lawns in the vicinity will soon be all dug up, for the ordinary human being cannot sit long on a bench and refrain from digging his heels into whatever is in front of him, if possible. They do it to a great extent in the walks, which, however, can be repaired, whereas if the turf is dug up it can't be again restored the same season if the digging process is repeated every day or two. We have found it necessary to fasten our benches down in the walks where the parks are largely used. Little damage to them has resulted since the first year. It was resented at first by some of the heedless and a few benches were broken by being torn up, but since then the damage has not been as great as it was previously, where many were broken by being moved about. It has been our practice to fasten benches down for ten years. As long as there are heedless people and boys with new knives or pieces of chalk in their pockets public property will be disfigured in proportion to the number of such persons coming in contact with the public property. Much can be done by education, but it will never entirely cease. The best way to minimize it is to keep everything in the best of order, repairing damages at once, and in having the officers watch sharply for offenders, and, when detected, appeal to their pride in the appearance of the park. This will not cure an offender on the first application by any means, but continued and well-directed efforts will work wonders in this direction as we know from experience here.

J. F. FOSTER,
Superintendent South Park.

Chicago, Ill., February, 1905.

Seats in any park are necessary. The quantity depends upon the needs of the attendance in the park. Where these are to be in constant use by large numbers of people, as in this city, cast-iron benches or wooden benches with cast-iron legs are found to be almost useless, because the cast iron is so easily broken. I prefer, therefore, a wooden slat bench fastened to wrought-iron standards with counter-sunk, flushed stove bolts, the ends of which are up-set on the nut after tightening, thoroughly painted, two coats in neutral tints. They can either be fastened down to the ground by iron rods or stakes or can be moved from place to place if the sod or walk on which they are placed is much dug out or worn by the feet of the people using the benches. I like the idea of reinforced concrete benches made in good shapes, especially for exposed places on elevations or along the lake front. If these are properly designed to suit the surroundings, they need not be conspicuous, and cer-

tainly will be more suitable for an Esplanade than the ordinary so-called park seats, which are too light for open piazzas or broad concrete walks. We find that a bench about 5 feet long is better than a longer one for scattered seats, as well as those which are placed near the band stand.

Specifications attached.

R. H. WARDER,
Superintendent Lincoln Park.

Lincoln Park, February, 1905.

SPECIFICATIONS FOR PARK BENCHES

Benches known as "The Belmont No. 156 Modified," to be 5 feet long, with two end supports of good, cold-rolled iron, $1\frac{1}{4}$ inches by 5-16 ($\frac{3}{8}$ is better) by 10 feet 6 inches (more or less), bent to approved pattern, and one middle iron of the same quality, 1 inch by 5-16 inches by 3 feet 3 inches, bent to suit.

To these irons are to be fastened 15 wood slats of seasoned, straight-grained ash, or other hardwood, each $1\frac{7}{8}$ inches wide by $\frac{7}{8}$ inch thick, and one top slat $2\frac{7}{8}$ inches by $\frac{7}{8}$ inch, all to be 5 feet long and dressed to fit the curve of the seat iron; also two braces of same material, $1\frac{7}{8}$ inches by $\frac{7}{8}$ by 4 feet 8 inches long; all slats to be properly fastened to the end irons with flat head, countersunk stove bolts, of suitable length and sizes.

Center brace is to be properly drilled and fastened to the back and seat slats with round-head screws of suitable size, put through this iron into the wood slats from the back.

All wood after shaping, and all iron after holes are drilled, is to receive one priming coat of lead and oil, and all benches, after being put together, to be well and thoroughly painted, both wood and iron, with two coats of lead and color, as directed.

All work and materials to be first quality, and best of its class, and to be completed to the satisfaction of the Superintendent of Lincoln Park and delivered at the park as required.

Kind of wood which is proposed to be used must be stated.

Lincoln Park, February, 1905.

In 1909 a canvass of the cities of the county was made to learn something of the best form of stationary bench for park use as indicated from benches actually in use. As a result of this canvass eighty cities were heard from and eighty-four different park systems. Fifteen of these cities had a population of less than 25,000, fourteen, 50,000, twenty-four from 50,000 to 100,000, sixteen from 100,000 to 300,000, and eleven cities of over 300,000 population, and including fifteen distinct park systems. Thus the cities responding well represented the conditions all over the country.

In these park departments eighteen did not use stationary benches, and nine of those of less than 50,000 population failed to answer this question, so presumably did not have stationary benches, making a total of twenty-seven that did not and fifty-seven that did. Of those that had stationary benches twenty-seven park systems used the ordinary steel or iron frame, wood slat park settee, and fastened it in a permanent place. Twenty cities used all wood seats, four all iron or steel, three concrete frames with wood slats, two both all concrete and all wood, and one concrete alone for permanent seats. The cities reporting the use of concrete were all over 300,000 population except one, and that is near the 100,000 mark. Only six park departments representing three cities, use concrete benches.

Roughly speaking, 32 per cent of the systems used no permanent benches, 32 per cent fastened permanently the ordinary movable iron-frame wood-slat park settee, almost 24 per cent used all wood benches, and 7

per cent used concrete in some way. The proportion of wooden benches was largest in the smaller cities

F. L. MULFORD,
Superintendent of Parks.

Harrisburg, Pa., January, 1911.

The subject of painting or housing benches, tables, swings and other wooden and iron appurtenances at once interests park superintendents. Benches especially being a very necessary convenience, and usually the first equipment provided, must be maintained in as good condition as possible at all times.

The park system in Kansas City, for taxation and maintenance purposes, is divided into park districts. The moneys collected for maintenance of parks and boulevards in each district must be expended in that district.

Our municipality being divided into five park districts, we have established an extensive operating compound near the center of each district. In these buildings we have provided ample room on the second floor, or loft room, for storing, repairing and painting benches as well as other light portable paraphernalia. Our benches are of iron-frame pattern with bolted slats. In the original benches purchased maple slats were used, which we found to deteriorate rather fast, and we have adopted oak slats which give much better service. The oak slats we obtain at a nominal cost at the planing mills, and we keep a supply constantly on hand for repairs. During the winter months we repair and paint all our benches, while stored, at odd times, with the ordinary park labor, bringing them out in the spring, practically as good as new each year. I believe this will be found economical in the long run as the life of the bench with this attention will be greatly extended.

The paint should be a good quality of oil paint, neutral in color, so as not to be conspicuous or obtrusive to surroundings; a dark brown color is excellent, and uniformity in color of benches, swings and other appurtenances is desirable.

Outdoor gymnasium apparatus, large swings and other appurtenances not readily transferred to barns, I think, should be painted annually for preservation and appearance; but I would recommend removing benches, tables and portable appurtenances of wood and iron, if at all possible, to a storage house at the end of the season, believing that just that little care and attention will warrant the expense involved in extending the period of their usefulness.

W. H. DUNN,
Superintendent of Parks.

Kansas City, Mo., November, 1907.

There can not be any question or room for argument that the most beneficial way of taking care of outdoor furniture, apparatus and appurtenances is proper housing for the winter and well painted or oiled for outdoor use during the summer. The extent of deterioration and damage of the elements, by neglect of proper care, will shorten the life of their utility at least one-half. More frequent painting will not offset proper housing during winter months, at any rate not in our climate.

F. NUSSBAUMER,
Superintendent of Parks.

St. Paul, Minn., November, 1907.

Nearly all of our several hundred benches are permanent benches. We have scarcely any to store away. By permanent benches we mean those that have heir legs planted in the ground. We think that such a bench is cheaper and less expensive to maintain than any of the movable benches

that we have tried in our parks. We use two sizes—10 feet with two legs, and 16 feet with three legs, which cost us, delivered on the ground, painted, \$3 and \$4 each, according to size, made as follows: A 16-foot 2-inch plank, 12 inches wide, fastened to three turned locust or chestnut posts which are planted in the ground so the upper part of the plank is 15 inches above ground; a brace for each leg fastened just above ground, with nails also at back of plank with leg screws; two rails bolted to upper end of braces to form back. Such a bench will last from ten to twenty years without much repair expense, painting being done by common labor. The one objection to the use of these benches is the footmarks made by the sitters when the benches are placed on the lawn, but the use of a little lawn seed and the rake occasionally remedies that; and again, these benches save a storing shed, which is a much greater defacement. Last winter, and, so far, this winter, the weather being mild, the benches were used to a great extent, particularly those along the shore, some pleasant days there being several thousand visitors in the park. As to the question of the life of a bench being prolonged by a good coat of paint, it must be answered in the affirmative.

CHAS. E. KEITH,
Superintendent of Parks.

Bridgeport, Conn., January, 1908.

DRINKING FOUNTAINS

The subject of drinking fountains is one that should, especially at this season of the year, be given a prominent space in the minds of park men, or, for that matter, any person who has in charge territory that invite numbers of people. The inducement to visit the park being given, facilities should be provided for their comfort, and there is no need in park departments so paramount as properly tempered, refreshing water.

Our department is at this time just entering into the practical end of revising drinking facilities throughout our parks. Our first attempt in this work was to place a number of the cast-iron bubbling fountains gotten out by Mott & Co. The frail structure of this bubbling fountain and the rapidity in which the overflow was clogged from gavel and other foreign substances thrown in the water made it impracticable to continue with this style of fountain.

The next effort was an artificial stone bubbling fountain with a perforated plate which obviates foreign matter from entering the overflow. This fountain is giving splendid results. The bowl is a work of art, the pedestal being constructed in proportion to the size of the bowl, the coloring of the stone blending very nicely with the park surroundings. This makes an ideal drinking fountain for all purposes, and ere long we hope to have this fountain in all the parks of our city.

We have been very fortunate in Cincinnati to have constructed an eleven million dollar water works containing a filtration plant which gives the water consumers of Cincinnati a crystal clear water 99 per cent pure.

Our department has been presented with three or four handsome and useful drinking fountains constructed to take care of both man and beast. In each instance these fountains were placed along a thoroughfare, and, if possible, under the spreading branches of a tree, that relief may be given to tired horses that were drawing heavy loads, as well as untold numbers of pedestrians who seek a refreshing draft of water and at the same time receiving the benefit of the cool shade of the trees. The shade also serves to keep the water cool on hot summer days for a greater length of time.

J. W. RODGERS,
Superintendent of Parks.

Cincinnati, Ohio, April, 1909.

In our parks here nearly all of our fountains are of the cast-iron variety with a continuous flow of water. We have pressed tin cups which we tie with a chain, and we have to perpetually replace them because people carry them off either as souvenirs or for some other reason.

The tin cup to drink out of in the park is not a satisfactory thing for sanitary reasons, and a great many people refuse to drink out of one of these park drinking cups because they do not know who used it before them; as a consequence, we are replacing all of our drinking fountains with the sanitary, bubbling fountain. We have them in all of our playgrounds and in some other places. The pattern we have costs us \$35. It is not a very ornamental affair, but it serves the purpose. It is made of cast iron and has four bubblers.

CHARLES G. CARPENTER,
Superintendent of Parks.

Milwaukee, Wis., April, 1909.

During my twenty years' experience in the Buffalo Park Department, I have had ample time to observe the various kinds of drinking fountains used in the parks of Buffalo as well as those of other cities, and must say that the drinking fountains of earlier days were not constructed on the elaborate styles in which we find them at the present time. A cast-iron pipe rising a few feet from the ground with the faucet at the top and one or two drinking cups fastened with a small chain to the pipe, with a cast-iron sink placed underneath and connected with the sewer, was all that was used to make up the drinking fountain of former days. This style had to be discarded as the sewers were constantly being blocked with sediment carried into them by rains and other causes. At the present time we use a cast-iron fountain constructed on an ornamental style, the catch basin being placed close to the faucet, and this, with a trap in the waste pipe, prevents any blockage or congestion whatever.

Our water is pumped in from Lake Erie, and it is hardly necessary to say that the supply is very abundant and exceptionally clear and pure. I have always found our water to be fairly cool in summer, which is attributed to the fact that our water mains are placed well underground and our fountains are erected in a shady spot. This latter phase in the construction of drinking fountains I find very essential to keep the water cool during the hot summer months.

We have also a few spring wells, the water being drawn from them by means of iron pumps. These are greatly appreciated by the public, and I am very much in favor of taking advantage of using spring water in our parks for drinking purposes whenever such an opportunity presents itself. The water is invariably pure and wholesome, and during the summer season cool, and consequently refreshing.

We have in Delaware Park a drinking fountain of which I desire to make particular mention. It is constructed of red Scotch granite and the design is of a rustic nature and in addition to its facilities for a public drinking fountain it also has a trough that it may be used as a watering place for horses. It was erected as a memorial of the late William McMillan, our first superintendent of parks, by a Scotchman of Buffalo and a few of his friends.

WILLIAM DONALDSON,
Assistant Superintendent of Parks.

Buffalo, N. Y., June, 1909.

Drinking fountains are a most important adjunct of every public place, whether for recreation or business. Until recently they have not been given much thought, and even now they are seldom provided in the busy centers of our cities where most needed.

In recreation grounds attempts have been made to meet this problem with varying success. In our parks we have partially met the problem in the simplest and most direct manner. Reservoir Park includes the

whole top of a hill, in the outskirts of the built-up section of the city. Wells have been driven from 80 to 120 feet deep and provided with force pumps. These provide an abundance of pure cold water. The latest pumps installed have a ratchet movement that makes them so easy to pump that children have no difficulty in getting water. Two granite iron cups are chained to each pump, with additional loose tin cups. The tin cups have advertisements in the bottom and are supplied free by merchants in the city.

On the Island playground water is obtained by driving a pipe twenty feet into the ground. Here a cheap lift pump is used.

The most recent installation has been a concrete fountain made of a block of concrete 5 feet long, 21 inches square at the base, and 15 inches square at the top. A saucer-shaped depression is moulded in the top and a 4-inch terra cotta drain pipe is encased in the block. This drain pipe is placed with the top of the bell flush with the bottom of the depression. It is desirable to use a tee or an ell at the bottom of the terra cotta pipe so you can have side access after the fountain is set. This block is set 30 inches in the ground. The water pipe is brought in through the terra cotta pipe. The terra cotta pipe is also used for the waste pipe. A perforated disk is placed around the water pipe in the bottom of the bell of the terra cotta pipe to act as a sieve to keep trash out of the waste pipe and to steady the water pipe. A bubble fountain of the automatically closing kind is used.

A water cooler was used in connection with this fountain and also with a memorial fountain in another park. This cooler consists of a 6-inch pipe 30 feet long, set vertically in the ground. The water is fed into the top and withdrawn from the bottom through a small pipe taken as directly as possible to the fountain. The device we have is patented, but equally as effective devices can be made by any superintendent without infringing on the patent, but they may be a little more difficult to install. We had the holes prepared by a well-drilling machine. Water from our mains during the summer runs about 78 degs. Water from one of these fountains was about 58 degs., the other 62 degs. In early morning, before they were used much, it was 4 degrees lower. It is claimed the device will cool the water to the temperature of spring water in the neighborhood. It has not quite done that for us this first year, but may do better after we have had sufficient rains to thoroughly settle the dirt about the tubes. The cost of fountain, complete with cooler, is about \$150.

The memorial fountain mentioned is along a city street though on the edge of one of the parks. It is a granite boulder provided with a place for horses to drink and also with two bubbles for man. It is a simple, dignified, appropriate fountain. Another good one is of large, rough, brownstone blocks placed under the shade of a beautiful elm, where the splash of the constantly running water invites both man and beast. The city is also fortunate in having a Herman Lee Ensign fountain, which is all that can be desired aesthetically and practically. Quite a number of the ornate, ugly cast-iron fountains are scattered about the streets of the city. They are useful, but it is to be hoped a way will soon be found to replace them with fountains of more appropriate material and better design.

F. L. MULFORD,
Superintendent of Parks.

Harrisburg, Pa., October, 1910.

PARK SIGNS

Simplicity, clearness and durability are the most important requisites in park signs. Those for restraining the public should be so short that they may be easily read by the passer by. While it may be necessary to post up park regulations at certain official places, these are usually too long to be fully mastered by the careless and often illiterate visitor. The

main necessary regulations should therefore be the subject of separate signs, each posted where it will do the most good.

Signs for the information of the public may, however, be somewhat less concise. When it is desired to mark special trees or shrubs the common name should be given first and be most conspicuous, the scientific name then follows, with a short statement of the distribution of the species and any important information concerning its value. To mark animal inclosures the same system should be followed. It is useful to append a map showing the distribution. When several birds or mammals are confined in the same inclosure it is well to have a simple picture of each attached to the sign.

The lettering should be very plain and of sufficient size to be easily read at some distance away. No ornamentation of any kind should be used.

Black letters upon light green ground make a satisfactory combination. Such signs are conspicuous without being obtrusive. The special paint called "ripolin" gives a smooth glossy surface that does not glisten and is quite satisfactory.

It is suggested that some accurate register be kept of the painting of signs, either on the back of the sign itself or in an appropriate book, in order to ascertain their life.

For toilet rooms, rubbish baskets and other situations where a number of small signs are required, green enamel with white letters is very good, being quite permanent and therefore cheaper than ordinary painted signs.

Experiments with varnish have not been satisfactory. Signs thus treated become dark and almost illegible.

For posts ordinary gaspipe sharpened at the ends has been found satisfactory. It is usually possible to obtain condemned gaspipe at reasonable figures. Where more stability is required such iron posts may be set in a concrete block.

No objections have been raised to placing signs along park drives.

FRANK BAKER,

Superintendent National Zoological Park.

Washington, D. C., March, 1910.

The matter of directing signs has not yet been taken up but will receive consideration in the near future. The enameled iron sign seems to us the neatest and most durable. We would construct the posts after a unique design and have them uniform throughout the city.

We use plain cardboard notices, which are for the most part destroyed before the end of the season.

For labeling trees we use zinc labels and etching fluid, but can not report on any success or failure.

We intend to print in our next annual report a catalog of all species of trees, shrubs and plants used in our parks, with notations of their hardness, etc.

E. F. A. REINRICH,

Superintendent of Parks.

Toneka, Kans., April, 1910.

We have a large number of park signs throughout our parks. They are all of wood, painted a fine white with black letters; the size of the letters depends on the size of the sign. We also have the name of each park stenciled on the leaner of each park bench. Black letters on red also looks very neat. We have no objections as we try to make them as neat as possible.

HERMAN H. BEYER,

Superintendent City Parks.

South Bend, Ind., April, 1910.

I am strongly opposed to the erection of any kind of signs in parks, but unfortunately we are compelled to use signs here and there.

My reasons for opposition to all park signs are:

First. Because it places in the hands of police officers the opportunity to discriminate in the enforcement of the rule or ordinance indicated by such signs. If there was a uniform and impartial enforcement of the regulations indicated by such signs it would be well and good, but such is not the case from my experience. Those citizens who may have committed some minor infraction are, with very few exceptions, of that class which unwittingly violate such rules and should be classed as ignorant first offenders. Such parties are fined in courts while others who make a regular practice of violating the same rule seem to be able in most cases to evade the vigilance of the police.

Second. I am opposed to park signs because they place a restriction on the same class of people for whom the parks are established and who contribute to the funds by which such parks are acquired and maintained.

Third. No matter how elaborate or inconspicuous a park sign may be made, it is nevertheless an eyesore and an encroachment on the park landscape.

JOHN ALGOTS,
Superintendent Special Park Commission.

Chicago, Ill., April, 1910.

I have never heard an objection to a neat park sign, and they are a source of great convenience when one is looking for objects of interest in a large park and for exits where there are several. On boulevards or parkways they are indispensable, especially to strangers, and should be placed where drives diverge and at the intersection of streets. They should be of artistic design, not large but neatly and plainly lettered in gold on a dark ground. In some cities in Europe the post or sign is of iron, letters raised and gilded. These are very neat but expensive, and require repainting almost as frequently as wood. There have been a great many enameled signs used within the past few years, but they are easily destroyed and have proven a disappointment; the small boy uses them for targets and the enamel is easily broken by the small stones they use as missiles of destruction.

C. M. LORING.

Minneapolis, Minn., April, 1910.

The question of suitable park signs is a difficult one. In order to give our rules legal standing they must be posted conspicuously in our parks. We do this by using the paper used by the Boston Park Department and having the rules printed in good legible type. These signs are then secured to the boards by moulding and varnished three coats with best spar varnish. This turns the paper from bluish to greenish. If the paper is sized before it is varnished it will keep its bluish color and is somewhat more legible but not quite so durable. For specific notices of two to a dozen words we use wooden signs with white letters on a black ground. These latter last three or four years. The average life of the paper sign is a year, when the paper must be renewed and the sign revarnished.

All park accessories are painted a bronze green as being the most neutral color; we think it even better than a dark slate color. Even oiled wood is too bright away from formal structures. Bright greens, yellows or reds are too obtrusive for any park use.

F. L. MULFORD,
Superintendent of Parks.

Harrisburg, Pa., May, 1910.

PARK RULES

The Wilmington Park Commission is empowered by its charter to make rules governing the parks.

These rules consist of ten sections with a total of about 300 words. They are posted in conspicuous places along the roads and paths, with special signs at carriage entrances.

My opinion is that the people will not stop to read the regulations, no matter how short they may be.

EDWARD R. MACK,
Superintendent.

Wilmington, Del., November, 1907.

It is our experience that people will not stop to read regulations longer than three words. We have cards about 12 by 18 inches posted at each entrance to the parks containing a synopsis of the rules about 300 words in length, but have found the best preventative in the vigilance of the policemen. We were greatly troubled at first by fast driving, shooting, and people allowing dogs to run loose, but by warnings and a few arrests and fines for the most persistent offenders have this pretty well broken up. The best remedy for stray dogs, we find, is a shot gun with a light charge of No. 10 shot. The suggestion of Mr. Price as to the distribution of small cards containing printed rules I think a good one.

ARTHUR HAY,
Chief Engineer.

Springfield, Ill.

The following are the rules and regulations of the Keney Park and city parks of Hartford. Those of Keney Park, as you notice, are very short and few, those of the city parks being much longer. It seems to me the shorter they are the better, and not posted except where necessary. I do not consider them in any way an ornament to a park and wish they need not be posted at all, but the law compels us to do so. It is my intention to publish in a small pocket pamphlet form the rules and regulations with other information regarding the parks and have them for general distribution.

GEORGE A. PARKER,
Superintendent of Parks.

Hartford, Conn., March, 1908.

KENEY PARK

NOTICE

Driving

Only vehicles for pleasure purposes are allowed on the park, and automobiles are not admitted.

Driving at rate of speed exceeding eight miles an hour is prohibited, and this regulation applies to bicycles.

It is prohibited

To build fires for any purpose.

To discharge or carry firearms.

To gather or injure any tree, shrub, or plant.

To hunt or disturb animals or birds.

To destroy birds' nests or gather birds' eggs.

To dump rubbish or material of any kind on the premises.

To disturb and annoy other visitors.

To hitch horses to trees or to leave horses unattended.

Dogs

Dogs which disturb animals or birds not be allowed on the premises.
Permits for special purposes granted at the discretion of the
Trustees, by the Superintendent.
Per Order of the Trustees,
G. A. PARKER, Superintendent.

HARTFORD PARK DEPARTMENT, 1907.

RULES AND REGULATIONS

The Park Board of Commissioners, by virtue of the authority vested in them, hereby make and ordain the following rules and regulations for the management of the parks owned by or under the control of the City of Hartford. Any person who shall violate any of the following rules and regulations "shall forfeit and pay for the use of the city treasury a fine not exceeding thirty-five dollars (\$35.00)."

It is forbidden:

1st. To enter or leave any park, except by the regular approaches thereto; to walk upon any grass border of any flower garden, walk, or driveway; to walk among or through shrubs, flowers, or other plantings, or to cross any lawn in any park whenever a notice shall be conspicuously posted forbidding such crossing.

2nd. To climb, or get upon any tree, statue, fountain, fence, gate, gateway, or railing in any park, or to use any structure therein in any way other than that purpose for which it was intended.

3rd. To remove, cut, or otherwise injure, any tree or shrub, or any part thereof; to cut, pluck, or otherwise remove, any blossom or other part of any plant or flower in any park.

4th. To cut, write upon, deface, defile, or otherwise injure any building, bridge, fence, statue, fountain, seat, gate, gateway, or other structure, upon the park.

5th. To permit any dog to pass over or to stray upon any park where sheep are pastured or kept, unless led by a cord or chain not exceeding six (6) feet in length, or to permit any other animal to pass over or stray upon any park area, but this provision shall not apply to horses when ridden or driven in harness, along the park roadways.

6th. To throw any stick, stone, or other missile on any portion of any park.

7th. To scatter or leave upon any park any paper, rag, garbage, or other litter.

8th. To void any urine, dung, or other excrement, within the limits of any park, excepting in such place or apartment as is, or shall be, specially provided for such purpose; and in the latter case, it is forbidden to use or enter any apartment established for persons of the opposite sex exclusively.

9th. To discharge or carry firearms, firecrackers, torpedoes, or fireworks, but this prohibition shall not apply to the display of fireworks under municipal authority; to make any fire; to have any intoxicating beverage; to sell, offer, or expose for sale any goods or wares, except under a written license from the Board of Park Commissioners; to post or display any sign, placard, flag or advertising device without such license; to solicit any subscription or contribution; to play any game of chance, or to have possession of any instrument of gambling; to make any oration, harangue, or loud outcry; to utter profane, threatening, abusive, or indecent language, or to do any obscene or indecent act; to bathe or fish; to solicit the acquaintance of, or follow, or otherwise annoy any other visitor.

10th. To drive or propel any bicycle, tricycle, automobile, or other vehicle, wheelbarrow, or handcart, on any park, excepting on regular carriage roads; to skate or slide upon or cross any walk upon any park; or to slide or coast on any driveway.

11th. To ride or drive any horse, bicycle, automobile, or other vehicle, or team, at a rate faster than six (6) miles an hour; to drive or lead any heavy team, business wagon, or cart, upon any park driveway or carriage-way, excepting upon park business.

12th. To take or molest any bird, fish, frog, or any living animal, or bird's eggs, or in any way interfere with any bird's nest, or with any cage, box, place or enclosure for the protection of any bird, fish, or any live animal.

13th. To sleep upon, lie upon, or overturn, any seat upon any park.

14th. For any men to occupy any seats designated as reserved for women and children.

15th. To play ball or any other games in any public park except upon such portions thereof as may be set apart for that purpose.

16th. To deface or injure any notice placed by the Park Commissioners upon any park.

The foregoing are in addition to such prohibitions and penalties as are provided by the laws of this state and the ordinances of this city..

Board of Park Commissioners,

GEORGE A. FAIRFIELD, President.

Attest, FRANKLIN G. WHITMORE, Secretary,

Hartford, January 6, 1902.

Adopted by Board of Common Council, February 10, 1902.

Approved by Mayor, February 11, 1902.

ALEXANDER HARBISON, Mayor.

Attest, HENRY F. SMITH, City Clerk.

GARBAGE COLLECTION

In our Penn's Common (49 acres) all refuse is collected daily and burned, there being not enough of the character of garbage to give trouble at any time.

The cleaning is done daily by one man, whose first duty is to see that wastes of all kinds are collected and burned and that the grounds generally are in a neat condition. In this park we have no receptacles for waste. As there is no picnicing the waste of the nature of garbage is small and is easily disposed of by burning with other refuse.

Different conditions prevail at Mineral Springs Park (63 acres). This park is essentially a picnic grounds and from early summer to late fall is used very hard.

The grounds are gone over every day and all waste collected and burned. It is possible to dispose of everything by burning until the cantaloupe and watermelon season arrives; then we have an excess of garbage and this we have been able to dispose of without any offense by adding it to our manure heap.

If your manure heap or compost pile is large enough you can dispose of the general run of garbage without offense and to a profit.

In this park we have barrels and boxes, painted green, placed close to the different pavilions. They are of great assistance in the collection of the waste.

The balance of our park area consists of hillside, woodland, and small plots throughout the city; the refuse from these is all burned.

WILLIAM I. HOCH,
Superintendent of Parks.

Reading, Pa., March, 1911.

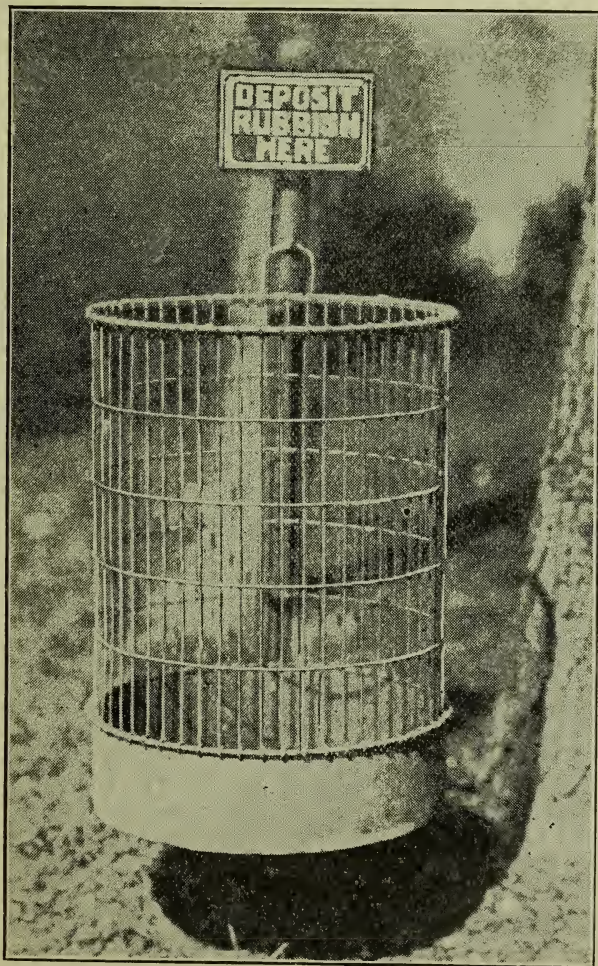
At all of our picnic grounds in the various large parks of our Bureau there are shelter houses which are in charge of an attendant, and the refuse is placed in the rear of each house at a location as much out of sight as possible in a wooden box, and the attendant's duties are to burn it the same day it is gathered.

For the other materials, such as newspapers, lunch boxes, etc., throughout the parks, an attendant gathers them into large sacks carried over the shoulder and burns them at the different stations.

GEO. W. BURKE,
Superintendent Bureau of Parks.

Pittsburgh, Pa., March, 1911.

Of garbage, strictly speaking, there is comparatively little in the National Zoological Park. Bones and other refuse from the animals' meat are put in tightly covered ash cans and sent each day to a fertilizer factory where the bone is ground and returned to the park as required. Other



garbage is put with the cleanings from animal cages, loaded into barrows, transferred from these to a one-horse cart and hauled away and composted with the stable manure. Waste paper, lunch boxes, etc., are deposited in metal boxes constructed in the park from our own design, as shown in photo herewith. This material is gathered into a light one-horse cart and burned. Leaves, short grass, and sweepings from roads are gathered with the cart just mentioned and are composted.

FRANK BAKER,
Superintendent National Zoological Park.
Washington, D. C., March, 1911.

Large galvanized receptacles similar to those used to receive ashes are placed at all points where picnickers congregate. This naturally means, as a rule, in the groves. Upon the side of each can notices are pasted asking the public to place all refuse in these cans. These are emptied regularly by the various gardeners' gangs and the contents burned. In addition a great deal of paper is left by the public scattered about through the park and this must be gathered by men who go about with an equipment similar to that of a rag-picker, consisting of a large burlap sack hung over one shoulder, and a short broom handle armed with a wire nail at the lower end. If some means could be devised to prevent the public leaving this collection of papers scattered about it would be an immense economy during the hot summer months. So far, we have been unable to prevent this annoyance, as it is usually done in the evening and the paper consists of newspapers left by those who have no further use for them. Individual cans attached to park benches would be possible only where benches are immovable, and our benches are practically all movable benches.

OGELSBY PAUL,
Landscape Gardener, Fairmount Park.
Philadelphia, Pa., March, 1911.

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OF THE

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LAWNMOWERS

My experience with this necessary adjunct to park work has been a rather extensive one.

We have tried nearly every known brand of the article and found all of them wanting in some respect. At present we use the "Coldwell," and while not perfect it has for a number of years given general satisfaction. We have used horse mowers for many years and for the last two seasons have tried some mowers propelled by steam or gasoline. It is claimed by the manufacturers that the latter will do three or four times the work of a horse mower, but this claim is somewhat exaggerated. The chief advantage of the motor mower is its weight as a roller and the uniform work it furnishes. It also does away with the disturbing factor of the digging up and tearing of the turf by the horse's hoofs, which often happens, no matter what precautions are taken. For close, even and careful work I prefer a motor mower to any other.

We expect to purchase from six to ten of these useful machines during the coming season, and intend to do away with horse mowers wherever possible.

WM. J. ZARTMANN,
Superintendent of Parks.

Brooklyn, N. Y., November, 1906.

The Coldwell hand and horse mowers are used in our department with satisfaction, the latter being the best I have found in the market. Some improvements have been made on the hand mowers last year which make the "Imperial" hand mower fully as good as any other machine I have had in use before.

GUSTAVE X. AMRHYN,
Superintendent of Parks.

New Haven, Conn., November, 1906.

There are so many different makes of these machines that it is a question which is the best. The hand machine that has given the most satisfaction all over the country is the genuine Philadelphia. I do not believe that there is a machine on the market today that will stand the wear and tear of this make. Of course there are Philadelphia machines of several brands, just the same as there are several brands of other makes of nearly all kinds of machines. The machine used in the Boston Park Department is the genuine Philadelphia, Style A. It is used exclusively as a hand machine, and has stood the test of being up against all or any other machine that any manufacturer wishes to send along. We have about thirty of these machines in constant use during the mowing season. During all my years of experience, and I have had lawns to take care of ever since I was able to run a lawn mower, I have never yet found a machine that would give the satisfaction of the machine I speak of, and I have tried every known brand that I know of.

Lawn mowers, like steam engines, will give satisfaction according to the care they get, and the life of a machine depends upon this also. We never allow a workman to interfere with his machine, but have the fore-

man in charge see that the machines are set properly and in working order, and if a machine is the least out of order it is immediately exchanged for one in first-class order.

In horse machines I have found the Coldwell the most practical of any. It is easily adjusted and is a well-made machine.

In power mowers I have had no experience, except with the Coldwell gasoline-burning steam machine. This machine is not worth house room, in my opinion. It will not do the work of two or three horses, as claimed for it. It is made too light in many parts to be practical, and will be found, like any auto, an expensive machine to keep up. It has one thing in its favor, that is, its roller, and, if used on a very even lawn, the tendency to less expense in repairing the machine will be the result. The idea of the machine is good, and, I believe, there is, or ought to be, a practical power machine on the market; still, it seems to me that, so far, the only practical power machine would be a steam, using coal for fuel, as in a small steam roller.

What mower, or hay-cutting machine has been found the most practical? In our country parks like Franklin we have a large territory which is kept in short grass, though not so short as with the lawn mower. We use exclusively the one-horse Deering machine, with $3\frac{1}{2}$ feet cutting bar. This machine has given the most satisfaction of any I have ever used. In parks the advantage of the one-horse machine will be found in the ease in turning and getting among trees, and in places where it would not be practical to use a two-horse machine.

In many parks, in my opinion, grass is mowed too short, especially during the dry weather, in summer, and the use of the sickle mower will be found of great advantage at that season when practically all there is to cut is the grass tops before they go to seed.

JOHN W. DUNCAN,
Assistant Superintendent of Parks.

Boston, Mass., December, 1906.

I agree with Brother Duncan that the Coldwell Excelsior horse lawn mower is a mighty good machine. Its simplicity, easy adjustment, and its parts all wearing so even makes it a little better than any other machine that I know of. I have just sent several of them to their factory at Newburgh to be put in order for next season, where by renewing the worn or broken parts and carefully overhauling the same, they return them in fine condition and they last throughout the season.

I used to think the old Philadelphia hand machine was about perfect (run a little hard, perhaps), but I could not keep track of the improvements or the adjustments of the new parts, on account, perhaps, of the density of my thinkcap or some other reason. But, anyway, I ran up against the Coldwell Imperial hand mower, and like them very much.

Last year I was induced to try a half-dozen of Townsend Matchless ball bearing machines, but some of the parts did not wear very well and this year I am back to my old love, the Imperial, for a hand mower.

The Syracuse Buckeye is, in my judgment, the best two-horse field mower for heavy work, harvesting the hay crop, and the Woods (that mark means I forget) one-horse field mower is the best for cleaning the lawn of plantain rods, timothy stalks and other tall matter that the wipers do not throw onto the knife.

We do not know much about power mowers, but believe the bright minds interested in their manufacture will produce something in the very near future that will be a complete success and relieve the horse from this portion of his work and the many defacements of the lawn which he commits in the performance of it.

C. E. KEITH,
Superintendent of Parks.

Bridgeport, Conn., December, 1906.

I use the Philadelphia, Style A, 17-inch, hand mower for the small lawns and obstructed turf spaces, and single and double "Osborne" clipper mowers for the larger open spaces. Where the latter are used the grass is allowed to grow from three to four inches in height before using, in order that the knives may cut to advantage. The cutter bar does not exceed 4 feet, to enable the machine to work to good advantage on side hills. I have used this mower on slopes of 3 to 1 with good results. I think it an advantage not to mow too closely during the mid-summer months, and this clipper mower answers the purpose admirably. I have abandoned the use of the Coldwell Excelsior horse mower for this reason, and I have not had experience with motor mowers.

WM. S. EGERTON,
Superintendent of Parks.

Albany, N. Y., January, 1907.

Although I have had a wide experience with lawn mowers I have come to like the Pennsylvania as well as any. It runs easier than the Philadelphia but does not last as long. Yet I do not feel I am a judge of them. For horse mower I prefer the Coldwell. So far the discussion has been on the machine. Something might also be said of the man who runs it. My experience is that a 16-inch mower is as wide as can be used successfully for continuous mowing; that a man will cover more ground with a 14-inch or 16-inch machine than with a wider one. I wonder how much is considered by the different Superintendents as an hour's work for a man? I have come to consider 4,000 square feet per hour as about right, as to average cutting; some men will do considerably more for one or two hours, but 4,000 square feet per hour, steady work, hour in and hour out, day after day, seems to be all that I can expect.

G. A. PARKER,
Superintendent of Parks.

Hartford, Conn., January, 1907.

Have used quite a few different hand lawn mowers in the last twenty years, and find the spring pawl 20-inch Philadelphia gives us the best results and suits our men better than any of the other makes. We have in use 108 of them, and it costs about \$2 each per year for repairs. We have been using the 36-inch Philadelphia horse mower for a number of years with good results, and find them somewhat cheaper than the power mowers.

I think the gasoline steam mower better than any of the others we have tried, but have failed to find one yet that will do twice the work of the one-horse mower.

H. S. RICHARDS,
Assistant Superintendent South Parks.

Chicago, Ill., February, 1907.

My experience with lawn mowers is very similar to other Park Superintendents. I have found the Coldwell the best horse mower, and when well adjusted and run by a careful, competent man I doubt if there can be much cause for complaint. As to hand mowers, we have such a variety of hand mowers and prices in Canada that it is not easy to get at an honest opinion. Then, so much depends on the man who uses it. My experience and observation has been that there is quite as much in the man who uses the mower as in the mower itself. There is only about one

man in ten who knows how or you can teach how to use a good mower. I would further add that many Superintendents cut the grass too close. This is a great mistake.

J. S. PEARCE,
Parks Superintendent.

London, Ontario, February, 1907.

On this reservation and connecting parkways the grass is not kept closely cut, and practically all mowing is done with "Buckeye" one-horse machine, 4-foot cut.

The grass is mowed twice and sometimes three times during the season and the crop is cured for winter feed for sheep and there is always a good demand for any surplus.

CHARLES P. PRICE,
Superintendent Middlesex Fells.

Stoneham, Mass., February, 1907.

It has fallen to my lot to have the privilege of using lawn mowers ever since I have been old enough to hold one, consequently I have used a good many different machines, but I have finally come to the conclusion that the Philadelphia, being very simple to adjust, and the new pattern machine very light draft, is one of the most complete and desirable machines that it has been my privilege to use.

We are now using them exclusively in our park work. Owing to the very rough, hilly surface of our parks we use a machine not exceeding 19 inches in length, as that is about as heavy a machine as a man is able to push and get good results—that is, and cover as much space as possible. We must have a light machine where the topography is as rough as it is in this city.

We also use a Philadelphia horse mower. It is very satisfactory, and we find that the cost of repairs, if carefully used, is very small. I have a rule that there is no adjusting to be done by any of the men using the machines, but when a machine is out of order, it must be taken to the repair shop and adjusted and placed in condition by a competent mechanic, and this has proven very satisfactory, and we have increased the efficiency of the machines, and lengthened their endurance by having them properly cared for.

For cutting grass in a place that is not required to be kept extra short, we are using a McCormick one-horse mowing machine with a 42-inch blade. After watching carefully last summer the results, I believe it would be prudent if some of the lawns were cut with an ordinary mowing machine, especially during the hot months, as it leaves a sufficient amount of growth so that the roots of the grass are not exposed, which, consequently, leaves the lawn in a much better condition to withstand the heat, and protects it from the extreme frosts of this climate during the winter. This, however, may not apply to points farther south than the Ohio River.

I believe the question of how closely grass should be mowed is more imperative than the kind of a machine with which it is mowed. It is evident that the best machine will be the most economical machine. It is also evident that the best results will be gained by having a machine that will leave sufficient grass for the protection of the lawn.

Another serious trouble I have encountered is to get men who understand handling a lawn mower so as to get the best results.

As to the steam or power mower—it would be impossible to use one in our parks because of the extreme slopes, as it would necessitate an expert engineer, and then at great hazard as to whether he would be

able to propel it up and down the hills with any degree of safety. Therefore, we have to depend upon the horse mower and hand mower entirely for use in our parks.

J. W. RODGERS,
Superintendent of Parks.

Cincinnati, Ohio, March, 1907.

Surely the greatest problem with lawn mowers is the man behind the machine. Like others, we forbid the men tampering with the machines in any way. When we can have a foreman that can adjust the machines we have the simplest and most satisfactory arrangement. Our greatest difficulty is to get men who understand the sharpening and adjusting of the machines, even at so-called repair shops. The hybrid mechanics *undo more* than they can do, so that we hold to our own workmen.

The hand mowers formerly used here were the Philadelphia, but over our hills they seemed pretty heavy. We are using mostly Coldwell High Wheel Imperial. They are giving satisfaction, and promise reasonable durability. We use 16-inch, and for hilly ground they are heavy enough. We have one Great American, 15-inch, which we are coming to think more and more of. The differences in the different makes of high-grade machines are not one-tenth the differences in the men who use them.

For horse mower the Coldwell is giving us satisfaction. Our Deering one-horse field mower has not been satisfactory as to durability, for some reason. It did most excellent work over our stony hill the first year our scenic park was seeded. Since then it is a killer for two horses, to say nothing of the one for which it was designed.

A year ago I took up the question of motor mowers, and after some correspondence, the only mower I felt like investigating was one built by William Simpson & Sons, Philadelphia; that appears to be entirely successful on the grounds of the Baltimore Country Club. The machine is a steamer with gasoline as fuel. The grounds of the Baltimore Country Club are hilly, and they claim that the machine did excellent work wherever they could use a horse machine, and did the work of three horses. I believe it is a machine worth looking into for ground not too steep. I confess I am afraid of it on our slopes.

F. L. MULFORD,
Superintendent.

Harrisburg, Pa., March, 1907.

With Bermuda grass to be cut ten months in the year, and every week at that, the subject of mowers is of considerable interest to us in the extreme South. The BULLETIN proves you have all found the same good points and defects that we have. I believe that with the constant use our machines are put to they will not last as long as in the North. The trouble, especially with horse mowers, is that the bearings are too soft. If axles and bearings were of tempered steel the life of the machine would be doubled or trebled.

E. BAKER,
Superintendent Audubon Park.

New Orleans, La., March, 1907.

We have discarded all but the Philadelphia, the latter proving most satisfactory as a whole for hand mowers.

E. T. MISCHE,
Superintendent of Parks.

Madison, Wis., April, 1907.

I have used several lawn mowers and have found the Continental by far the best. It is of simple construction, easy to run, and with ordinary good care will last for several seasons, working well until the finish.

As a horsepower machine I prefer the Philadelphia lawn mower.

But for large lawn spaces we use one and two-horse Deering sickle, 5½-feet cut, which gives very satisfactory results, cutting the finest grass clean, but not too close.

WM. R. ADAMS,
Superintendent of Parks.

Omaha, Nebr., April, 1907.

We had extensive experiments with quite a number of different makes of lawn mowers. We have now only one make in use, "Sterns Ball Bearing," 16-inch and 18-inch. It runs easy and cuts clean. We have our own repair shop and buy the parts needed from the factory. This mower is the most economical, considering every point which a mower should have, that is expected to do good work.

The great trouble is that the manufacturers of mowing machines get careless on the material put into them and the machines are not turned out even enough in good material to sustain a reputation of first-class merit, consequently you can never tell what you get when buying a lot of lawn mowers.

The topography of our park land does not admit of using power or motor machines. We use horse mowers of different make to good advantage.

F. NUSSBAUMER,
Superintendent of Parks.

St. Paul, Minn., April, 1907.

We have tried several makes of mowers and have settled on the "Pennsylvania B. B. Jr." as the best and most satisfactory for our use. It runs easily, cuts clean, is readily adjusted and for cutting high grass we have not found its equal. We are using the 19-inch cut, and think this size best adapted for general use.

The "Philadelphia" may be more durable, but the fact that the "Pennsylvania" is lighter and runs easier should balance that point of superiority.

We had several Townsend's "Lion" mowers in use last season and they proved to be good machines, but we had some trouble with parts breaking when subjected to hard usage.

"Coldwell's" horse lawn mower is the best we have used. Have not had any experience with power mowers.

All our repairs are done in our own repair shop. The ideal way is to have but one man adjust the mowers, but we have not always found this practicable.

C. A. BOSSEN,
Assistant Superintendent.

Minneapolis, Minn., April, 1907.

We have tried a variety of mowers, and find objectionable features in most of them. None of the manufacturers seem to take as much pride in their work as formerly, and I do not think the machines on the market today are as well made as those used fifteen or twenty years ago.

In this park we are using the Coldwell "Park" mower with high 10-inch wheels, four blades on the wiper, 18-inch cut. As several contributors have stated, as much depends upon the man pushing the machine as upon the machine itself, and it is our practice here to keep a light truck with

the necessary tools in attendance upon the men mowing, so that any imperfection or break of any kind can be repaired at once by the foreman of the mowing gang, who should have some mechanical genius. The men are not allowed to tamper with the mowers, and the foreman keeps the machines in adjustment with proper tension of the joints and just enough oil. Too much oil is wasteful and leads to loosening joints.

We are also using one 35-inch Coldwell horse mower, one 36-inch Philadelphia machine, and one 40-inch Philadelphia machine, and like all three of them. Each has advantages. The one experiment we tried some years ago with a motor 40-inch machine was not successful. I understand this class of machines has been much improved since that time.

R. H. WARDER,
Superintendent Lincoln Park.

Chicago, Ill., April, 1907.

Have had little experience with lawn mowers. But that little has convinced me that the man who cares for and runs them, whether hand, horse or power machines, has as much to do with the life of the lawn mower, and results accomplished, as the make.

A. V. PARKER,
Assistant Superintendent of Parks.

Worcester, Mass., June, 1907.

In our experience here, which has been the use of a great many makes of lawn mowers, we have about simmered down to the use of the Pennsylvania 17-inch, plain, old-fashioned lawn mower, and for the horse mower we have had the best results from the "Coldwell."

W. H. DUNN,
Superintendent of Parks.

Kansas City, Mo., June, 1912.

DESTRUCTION OF LAWN WEEDS

Near our Sea Side park a lawn consisting of several acres, surrounding a private place and situated on a bluff facing the sea, became badly defaced with yarrow (*Achillea millefolium*). To become rid of it the owner had removed one inch of the whole surface, using for that purpose a horse-drawn turf cutter, doing it very quickly and cutting a strip 15 inches wide, as fast as a horse could walk, the turf carted away and made into a large compost heap. The skinned ground was worked over and well fertilized and reseeded with a high priced, well advertised, fancy mixed, velvet textured, never failing lawn grass seed, and of course the owner was confident of having in a few weeks a lawn that would be a thing of beauty and a joy for several years. But, sad to relate, there was no improvement on former appearance, and his neighbors and friends fully forgave him for the very warm language used and fully endorse the characterization of the person who advised and sold to him the material used. The mouse-ear chickweed (*Carastium*) is a very difficult growth to banish from a lawn and resists the crowding out process, being more likely to smother than be smothered by the true grasses.

The annual summer grasses, we are told, are a provision of nature to cover her nakedness. Although with us they do not come in until mid-summer they give us much trouble and deface more lawns than all other pests combined. In a new lawn, unless put down very early, and is thick and vigorous, this summer grass will start several weeks later,

wherever it finds sufficient space, and by its rank growth, smother all true grasses that it can over-top, more so than do the rye or oats that some people sow with their lawn seed on the supposition that it benefits by shielding, while in reality it kills a large portion of the more slow-growing, true grasses, by taking from them the moisture, light and nourishment, or, in a word, smothers them. The next spring there occur bare places ranging from a few inches to quite large spaces, caused chiefly by the annual grass and grain growths of the previous year.

In making a new lawn or patching an old one, we use equal portions of the best cleaned *red top* and *Kentucky blue*, adding while mixing 5 per cent white clover. Sow thick and as early as possible, directing the men, with backs well bent, to pass their hand all over the space between the marks, which are about four feet apart, their further employment depending on the seed being evenly sown. Rarely a man will insist the old way is best, with the stomach and chest well forward and head back, he throws the seed broadcast with a long swing of the arm or by a little thrust of the hand throws a pinch of seed here and there. He is at once given a chance to work for some other person. The seed being sown, we apply a good dusting of wood ashes about two tons to the acre, using care in raking the seed in, to scatter the bunches of ashes if any occur. Roll with 300 to 400-pound hand-roller and in 14 to 20 days start the hand mower, gaged to cut quite high. We commence as soon as the ground settles in spring to patch the lawns, doing the shaded portions first, so the grass will get a good start before the lawns are developed, using a sharp iron rake to clear and loosen the ground carefully, sow the seed thickly, apply wood ashes, rake the seed in and roll as above. If you have not used wood ashes as above, just try it and be agreeably surprised. Hello! Hello! Hello!

CHAS. E. KEITH,
Superintendent of Parks.

Bridgeport, Conn., February, 1910.

Dandelions are usually not troublesome to a serious extent in lawns that are mowed with short grass mowers and are exposed to the sunlight. Shade or partial shade checks the growth of grass, and under such conditions dandelions cannot be suppressed by mowing. There seems to be no royal road to the getting rid of this pestiferous weed; it can, however, be eradicated in the following manner: plowing up the turf and cultivating it weekly, during the months of July and August, with an ordinary harrow or a planet cultivator, seed down in September with as clean seed as can be obtained under the processes adopted for cleaning seed by mechanical devices. If manure is used in preparing the ground for the reception of the seed, it should be rotted to the extent that it shall have destroyed all seeds that it may have contained. This, with clean seed, is of prime importance.

J. A. PETTIGREW,
Superintendent of Parks.

Boston, Mass., February, 1910.

I think that in making lawns, that if possible to obtain it, good solid turf from rich, damp soil is used it is the best possible thing to do in the start. After that is done I never use any kind of manure but use ashes that have not been first weakened for other uses before being put on the market, and the best kinds of commercial grass fertilizers from reliable formulas. If this course is followed few weeds, of any kind, will appear, or if at all, cut them out with small trowel or case knife before they go to seed, and thus keep a perfectly clean, weedless lawn. The work of cutting out dandelion and plantains, burdocks and crab grass can be

done much faster than one that has never attempted it would believe was possible, but once clear of these lawn destroyers, if you then use gress fertilizers and cotton seed meal and abandon use of any kind of animal manure, I am confident that you will soon have a soft, velvety lawn and save money in the long run.

CHRISTOPHER CLARKE,
Park Commissioner.

Northampton, Mass., February, 1910.

The best remedy I have discovered to remove dandelion from some of our park lawns is a very simple one. We have here in New Haven some 35,000 Italian settlers; among these a large number of Italian women get out in early spring to collect dandelion along the country roads and fields. It struck me to be a good idea to turn over our park lawns to these busy women and have someone oversee them while there during certain hours. The experiment had a wonderful effect upon the lawns, and the treatment did not cost us a cent. If any of my brother Superintendents are located in towns where there are lots of Italians try the experiment and report to me how it worked.

G. X. AMRHYN,
Superintendent of Parks.

New Haven, Conn., March, 1910.

On some of the lawn areas in the park where the first improvement was not satisfactorily made in the matter of supplying sufficient black earth, we have had considerable trouble suppressing dandelions; in fact, have been unable to control them in some places. There are also some places where the lawn was properly prepared that, for some unaccountable reason, the constant mowing does not remove the dandelions.

We have not as yet taken any unusual methods to rid ourselves of any of the obnoxious weeds named in the subject matter of this bulletin. I should like very much to hear from anyone who has had any experience or who has given the subject sufficient thought to have any suggestions to offer.

Our worst trouble seems to be on lawns where there is not to exceed two inches of soil over sand.

We are making some investigations in this matter at this time and I shall be glad to contribute the results of our investigations, and what we propose to do, a little bit later, but in the meantime, as said before, I hope to have the benefit of the opinion and experience of others in this matter.

J. F. FOSTER,
Superintendent of South Parks.

Chicago, Ill., May, 1910.

The dandelions on the lawns surrounding the "Phipps Conservatory" are very plentiful this season, although we have not tried to suppress them in any way other than having our men to re-cultivate the lawns in the fall and sow them down the following spring.

As regards to "chickweed" in spots and in other parts of our lawns, will say that we have eliminated this weed to a very great extent by re-sodding the locations that are thickly covered with these weeds.

As to other weeds, I find they come in lawns which have been from six to eight years laid down in sod, and which have not been given the proper nourishment of fertilizer to give a good, healthy growth of lawn grass.

GEO. W. BURKE,
Superintendent Bureau of Parks.

Pittsburgh, Pa., May, 1910.

CROSS CUTTING ON LAWNS

Cross cutting on lawns may be prevented by planting shrubbery at the points where the path starts and ends.

A few signs appealing to the good sense of the public may also tend to obviate difficulty. Where possible a neat, low fence placed at these points and extending to short distances on either side may also be helpful. But the best way of all is to so lay out the paths and walks in the park that they will take the shortest distances from points of entrance and exit and cause no temptation to cross the lawns.

J. J. LEVISON,

Arboriculturist, Brooklyn and Queens Park Department.
Brooklyn, N. Y., February, 1911.

We get good results from the following:

Prominently displayed signs reading: "Please do not walk in the beaten path."

Barricading the beaten path with lawn chains, shifting them as indications show travel is being confined to other places.

Planting shrubbery across a worn path where it would be in keeping with the surroundings.

Erecting iron fence in shrubbery where people insist on making a path.

In some instances constructing a walk where travel indicates a necessity, if in keeping with the general plan of that vicinity.

H. S. RICHARDS,

Assistant Superintendent of South Parks.
Chicago, Ill., February, 1911.

The habit of forming paths through shrubberies can best be overcome by planting an edging of some such plants as *Berberis thunbergii* at the point where the path is started. In some cases a few strands of ribbon barbed wire, painted green, will afford a barrier that can be placed out of sight in the shrub bed. Where low hedges are not respected at night a single strand of barbed wire, painted green, and stretched in the body of the hedge, is not objectionable but effective.

Well-kept paths affording direct communication do much to overcome the temptation to cut across lawns. By this is not meant straight paths, but paths as nearly as possible paralleling the natural lines of travel. Good plantings of shrubbery at the path entrances help the public to find the path. If it is during the growing months prompt re-sodding of the bare spots will help call attention to the damage that is being done to the lawn.

C. H. HECKLER,

Superintendent, Harbor Hill.
Roslyn, L. I., March, 1911.

Most of the wearing of paths across lawns and alongside walks are due to poor designing of the park. If the trouble is at all general or extensive, I would advise that a change be made in the design.

If the public will habitually and generally leave a walk to make a short cut across turf or through shrubbery, it is more than probable that there is excellent reason for traveling by that route. Instances occur where the very route so casually selected should be recognized and graded as a permanent detail; again, this may lead into an excessive number of walks, of complicating the purpose of walks or in seriously frittering away the elemental beauty of the park. It is in foreseeing, guiding, con-

trolling and effectively solving the problems of park usage while still securing a beautiful result that give an opportunity to a good designer to exhibit his qualifications.

The comfort with which a walk may be used, both as to grade and softness of tread, has bearing on all the difficulty.

Fencing, wiring, and especially barbed wire, is bad. Plain railing, especially if covered with clinging vines, is better, and best, perhaps, is where an appropriate construction object, such as a shelter or other needed mass, would fit, or a plantation of prickly vegetation.

It is all a question of fitness. If in the downtown congested district an iron fence may be the best possible solution, whereas in a woodland park the more rural type of solution by vegetation or location of passageways would be a better means.

E. T. MISCHÉ,
Superintendent of Parks.

Portland, Oregon, March, 1911.

In the construction of public parks and other recreation grounds of a kindred nature in the past decade the comfort and convenience of the masses has been sacrificed for the gratification of the few; consequently, we are now reaping the results in this age of trying to accomplish something in the shortest period of time.

It is a difficult problem to get the pedestrian to take the curvilinear route when the short cut across the lawn or plantation will take him to his destination in one-tenth the time. The period of "Keep off the Grass" is past, and the masses are taking advantage of this extended leniency. Barriers of all kinds are overcome, and legal regulations are either not recognized, or are insufficiently enforced.

Why cannot we realize this predicament we have got ourselves into through our ambition? Cannot we overcome this evil to some extent by making some concessions to the apparent requirements and demands of the people?

The placing of walks where the masses want them may not be good judgment or taste from a landscape point of view, but from a view of utility and public service it should receive some consideration. Surely the requirement or ability of the landscape architect will not lose any of its prestige when he has to overcome the appearance of a discordant pathway in exercising his skill to alleviate this great evil which has become in our daily pursuits, hard to overcome or eliminate.

JOHN BERRY,
Superintendent of Parks.

Colorado Springs, Colo., March, 1911.

We have been troubled with cutting across lawns at the small parks in Medford, and have tried various expedients to correct this. The arrangement of paths was designed to meet the probable use, but some of the travel was not anticipated. A change in paths, or a new path, did not stop the trouble, and when seats were placed across the line the boys used them for hurdles. Shrubbery groups seemed to be more effective, but something was needed to protect the shrubbery, especially at the park boundary.

We find effective and not unsightly a No. 6 woven wire fence $4\frac{1}{2}$ feet high, with 2-inch tubular posts and $1\frac{1}{2}$ -inch top rail; the whole painted with green graphite paint. The vertical wires being less than 2 inches apart afford no footing for climbing.

EDWARD P. ADAMS,
Engineer of Parks.

Medford, Mass., March, 1911.

According to my experience the fault is with the plan. Too many plans are made and executed which are all design, with utility and fitness left entirely out of consideration, while we should keep all three of these principles in mind when making plans for landscape development. By design I mean the outline of walks, drives and other fundamental features of the plan, and the grouping of trees and shrubs, and locating of lakes, rockeries, fountains, etc. In the finished plan on paper we see the whole grounds at one glance and we generally find all features in harmony with each other, but here we ought to stop and scrutinize the plan to its minutest details and make the walks—and drives—also—between objective points straight, or nearly so, remembering that a curve in reality is much stronger than it appears in the plan. The reason for this is, the plan is a birdseye view, while on the ground we see everything in perspective. The modifying or flattening out of curves, especially on lines of main travel, will not only greatly enhance their utility but also increase the beauty of the landscape. We must also keep in mind "fitness." To illustrate this point I will give the following example: A rockery built on a slope or a break in the ground, either natural or artificial, will look proper and pleasing, it carries the stamp of fitness, while a rockery on the level ground is nothing more or less than a pile of stones; no matter what we plant on or about it it will remain incongruous.

Cross cutting over large lawns or principle parts of parks is sometimes caused by a misplaced entrance. If the latter is located in the middle of one side of the grounds and the walks inside lead around to the right and left, but finally come together again at some point of interest, thus inclosing by beautiful curves a spacious lawn, the public will take the short cut and beat out a path in a straight line to the feature of general interest. In this case the evil may be eliminated by moving the entrance to a corner from which most people approach the grounds or to a place from which the line of travel is more direct. In some cases it may be necessary to construct a new walk where the public is inclined to travel. I have successfully prevented cutting across corners by planting at the critical point a group of roses, rugosa, rubiginosa, etc., edged with *Berberis thunbergii*. Passing through shrub group on borders a single plain wire stretched in the shrubs near the edge will stop the evil without being conspicuous.

The beating out of paths along the sides of walks is the most difficult problem confronting me in our parks, but our walks are made of cinders, one of the most disagreeable materials for walk surfaces. I have suggested, therefore, the construction of cement walks. Though hard to walk on and cold to look at they will always be smooth and clean and are cheaper in the long run.

At Las Vegas, New Mexico, the Santa Fe owns a hotel, surrounded by one acre of beautiful lawn made of sod shipped there from Topeka, a distance of over 700 miles. These grounds are adjacent to the platform immediately north of the depot and came near being ruined by people flocking over it going to and from the trains. Not only that, but the natives tried to make it a feeding yard for their burros. To erect a fence or even put up signs was out of the question from an aesthetic standpoint, so I suggested a 12-inch stone or brick coping with a low iron cresting on top. This plan was adopted, and before the cresting was placed it was found that the coping alone was sufficient to entirely eliminate trespassing.

E. F. A. REINISCH,

Engineer and Superintendent of Parks.

Topeka, Kansas, March, 1911.

In Mount Royal Park, Montreal, no signs are placed to insist upon people keeping off the grass. My experience is that, whenever people have started cutting across lawns nothing would prevent them from doing

so and spoiling the lawn; wherefore, when this happens I do make paths, and thus save the general appearance of the grass.

The formation of paths in shrubbery is prevented by planting nothing but solid shrubbery through which no trespassing can be afforded.

JOHN HENDERSON,
Superintendent Mount Royal Park.

Montreal, Canada, April, 1911.

With reference to the subject of this BULLETIN, I have not yet been able to arrive at a proper solution of the difficulty. The only method which I find to be efficacious is to run temporary fences across all such by-paths, and endeavor to provide more walks where they are most in demand, but a great deal of education will be necessary before the people can be induced to keep to the paths and not follow one another in "goose tracks" across the lawns.

JAMES WILSON,
Commissioner of Parks.

Toronto, Canada, April, 1911.

NATURALISTIC PLANTING ON ROUGH BANKS

Our largest park, "Lake Park," has a frontage of over half a mile on the lakefront. From the shores the land rises very abruptly to the top of the slope where a road is constructed overlooking the lake. This strip varies in width from fifty to one hundred feet between the road and the lake.

To protect the bank from the inroads made by the action of the waves, caused by the lake steamers, it was found necessary to construct a revetment wall the entire length of the waterfront. In building this wall all the stone had to be delivered from the road above, and this work of delivery tore up the banks in many places so as to necessitate a general smoothing up of the surface. Care was taken to preserve all the roots of the plants growing there, except the white or gray birches and scrub oaks. These we treated as weeds and destroyed. We now have a good growth of wild grasses, brakes, blueberries, sumac, daisies, and other low-growing wild plants covering this land.

The condition of the ground fronting the lake being in such marked contrast with the grounds in all other sections of the lake has called out more or less criticism from those who believe that the natural conditions of the wooded shores are preferable to the condition the park lands are now in. On the other hand a great number express an opinion that the parkfront looks the best of any part of the lake. So we find ourselves "between the devil and the deep sea" in trying to treat this tract in a proper manner.

Now comes my question: As a compromise measure we want to plant out some sections of this land so as to restore it to a more natural condition, and at the same time it must be of low growth so as not to shut off the views of the lake, for which the drive on the bluff was built.

The soil is coarse gravel with a thin turf well filled with the plant life mentioned above.

What kinds of native plants can we use for this planting that will thrive on this gravelly embankment? We want everything about this park to be of the native species of trees and plants, and do not want to let the grey birches come into possession again.

JAMES DRAPER,
Secretary of Park Commission.

Worcester, Mass., 1902.

In a few years the natural growth of low shrubs of great variety will cover the ground, but if it is desirable to hasten the forest cover I suggest that on the most open spots the common wild rose be set out in plots with irregular outlines; plants to be placed about two feet apart, to be thinned out to about four feet apart after a few years. Low, running blackberry would add an attraction and its leaves as well as those of the rose bushes would give beautiful fall tints.

NATHANIEL MORTON.

Plymouth, Mass., 1902.

In regard to Mr. Draper's request, Mr. Morton's suggestion of wild roses and blackberries as a ground cover for a gravelly bank cannot be beaten; yet, if a larger field for selection is needed, the following might be added:

Berberis vulgaris (can almost be called a native), *Smilax rotundifolia* (cat brier), *Andromeda arborea*, *Kalmia latifolia*, *Myrica cerifera*, *Pyrus nigra*, and *Arbutifolia*, *Rhus aromatica* (in sunny spots), *Viburnum acerifolium*, *Viburnum dentatum*, *Viburnum lentago*, *Celastrus paniculata*, *Rhamnus catharticus* (not native, naturalized from Europe), *Leucothoe catesbaei*, *Corylus americana* (hazel nut), and *Amelanchier canadensis*.

J. A. PETTIGREW,
Superintendent of Parks.

Boston, Mass., 1902.

I think the selection of native plants by Mr. Morton and Mr. Pettigrew are excellent, but why not add a few witch hazels to brighten the late season with their handsome fall foliage or pretty little blossoms; or such plants as the common Indian currant (*Symphoricarpos vulgaris*), the sweet fern (*Comptonia asplenifolia*), *Cornus paniculata*, *Cassia marylandica*, or *Ilex monticola* or *Leavigatus*, or the Jersey tea *Ceanothus americana*; and why not add a few more climbing or trailing plants? I refer to such species as *Clematis virginiana*, *Ampelopsis quinquefolia*, *Apios tuberosa*, *Lonicera sempervirens*, *Bignonia radicans*, *Vitis cordifolia* or *Vitis riparia*. These, with their various attractions of flowers and fall foliage, will add greatly to the natural effects desired by the proposed planting.

JOHN W. DUNCAN,
Assistant Superintendent of Parks.

Boston, Mass., 1902.

DEFORESTATION

Our good President's message has just come to me, and in my judgment his writings on the deforestation that is now going on in the country should be approved by all lovers of trees, be he ever so humble.

He tells us that northern China a few centuries ago was the most fertile and beautiful spot in the entire world. Its flora was the most luxuriant, its slopes even to the mountain top were heavily forested and its vegetable production was such as to make the heart glad. Her rivers were large and deep and navigable for large boats. As long as the forests were left intact its plains at the foot of the mountains were among the most fertile on the globe and the whole country was a garden.

He also writes of the glory of the forests of northern Africa and her fertile plains which were in the old Roman days the granary of the world. He enumerates several other countries that were covered with forests and abundant verdure which made them the garden spots of their times. But all this has been changed. The never-ceasing deforestation

by reckless cutting, burning or uncontrolled grazing has destroyed the sources and supply of her rivers.

The great masses of arboreal vegetation which gave off abundant currents of cool air, caused by the absorption of the heat by the sun would bring the moisture-laden clouds lower and force them to precipitate in rain a part of their burden of water has been destroyed. And the barren mountains which have been stripped of their vegetable growth do, under the scorching of a shadeless sun, send up currents of heated dry air which drive away the rain clouds. So on account of the absence of moisture, which is one of the three elements (heat, moisture and air) which all vegetation must have in order to grow, these beautiful countries written of by our President have become desolate and almost uninhabitable.

Their rivers have nearly disappeared, except for a short period after a storm, when they become raging torrents of muddy waters, committing destruction and disaster everywhere because there is no sphagnum or bog in the lowlands, no roots or leaves from the trees and no humus of the soils to hold the water in check, to store it up for future use; all because these countries have allowed their forests to be wasted away.

The President has sounded the alarm and cautions his people to be on the watch, for already deforestation has crossed the famine line in this country, in the Adirondacks, the White and Rocky Mountains and the Appalachians. So let all of us do our little or much towards the preservation of all that we have and the creation by planting or seeding of all that we can.

Hello! Hello!

CHAS. E. KEITH,
Superintendent of Parks.

Bridgeport, Conn., 1910.

HOW CAN THE PARK SUPERINTENDENT ASSIST THE CITY FORESTER?

The question of how can the Park Superintendent assist the City Forester must be of interest to us all. If they are both professional men of ability and experience and have progressive ideas, they should naturally work together as the pulling team of the city beautiful. Their interest in the community will be felt to an extent that even those blind to such matters of civic beauty and progress become observant and get imbued with the desire to give a helping hand in the work.

We all agree that only men of professional knowledge and experience should fill the positions of Park Superintendent and City Forester. The Park Department of a city should really be in charge of all street trees, with a special allowance for that work. Where this is not the case the Forester and Park Superintendent must make common cause of their two different departments.

They can work out together ordinances adapted for their city and get them passed by the proper authorities and have them enforced. They can work out planting plans both for streets, boulevards, parkways and parks, which form a systematic, harmonious whole.

They can help each other out with planting material, be it soil or plant. They can support each other in their separate battles against greed, ignorance, neglect and vandalism. They can join forces to fight insect pests, woodfires and other common foes. They can exercise their personal influence in the community to help along each other's aim of worthy progress. They can, with combined force and energy, accomplish what

either one of them could not do alone. To do all that I say they *can* do, they must join hands in true friendship for nothing less than the common and mutual love of their work.

THEODORE WIRTH,
Superintendent of Parks.

Minneapolis, Minn., November, 1907.

HOW CAN THE PARK SUPERINTENDENT BEST ADVANCE AND INTEREST THE CITIZEN IN HIS WORK

This, to my mind, is a very important matter and one that should be kept constantly in view by the Park Superintendent and also his Assistant Superintendent in each park throughout the city.

In the first place, do not be afraid to give the citizens your aid and all the information you can on all topics of horticulture.

Then the Superintendent and his assistants should be accessible at certain hours of the day in the park so that any citizen may go to him for information. Those who have never tried this have no idea how the citizens will appreciate it.

The introduction of new and useful varieties of flowers, bulbs, etc., will add very materially to the interest and pleasure of the citizen. Call his attention to these through the press.

Park work should be made educational, and so many things can be illustrated and explained in the park or greenhouse that you will find many coming to you for information.

Regular hours in the office are also desirable; many may like to see you there. Use every effort to awaken an interest among the citizens, especially the mechanics and average business men.

An occasional article in the press on flowers, trees, shrubs, hints to flower lovers, etc., will be welcomed by all who have a taste for flowers. A talk or a paper read before some of the societies or clubs will be very beneficial.

J. S. PEARCE,
Superintendent of Parks.

London, Ontario.

There are so many ways by which the public can be interested that, were I to try to dwell upon all, it would be an almost inexhaustible subject, but, nevertheless, in Cincinnati, beginning with the winter season, we try to furnish skating to as great a number of people as is possible with the present area devoted to ice in our park system, and again the amusement depends upon how much freezing weather we have in this vicinity.

In addition to the lakes in the various parks, we flood all of the ponds and low places throughout the city where it is possible to get permission from the property-holders. This is available through the courtesy of the Chief of the Fire Department, who loans the hose for this purpose.

We have our trees labeled to give as great an amount of scientific knowledge to the frequenters of the parks as possible. We also plant in our flower beds as great a variety of carpet bedding and blooming plants as the capacity of the greenhouses will allow. This makes a very pleasing feature, and is educational to the close observer of floriculture and horticulture.

We are now equipping the downtown parks with playground paraphernalia, which will afford a great number of children in the immediate

neighborhood recreation and amusement, and at the same time will insure parents of the safety of the children while in this playground, as the attendants at the park are supposed to see that nothing of a serious nature happens to the children while in the confines of the park.

The planting of shrubs covering most of the varieties indigenous to this climate is being taken up vigorously.

We have so arranged our greenhouses that there is a constant exhibition of blooming and ornamental plants throughout the year, and we are constantly adding to our collection. While the herbaceous plants have been given but little thought, and very little space, we contemplate taking up the planting of herbaceous perennials, and are also looking forward this summer to the establishing of an economic garden, which will prove very interesting and educational to the entire public. In this we want to cover both the edible and the chemical-producing plants.

We are furnishing music in the large parks at the present time, and I believe that it will prove of great interest to the communities to establish concerts in the parks of the downtown districts, that the laboring people may have music brought near their homes. This is a feature that would bring both pleasure and refinement to the inhabitants of thickly-populated districts that could be obtained in no other way by that class of people.

These are a number of features that have been given attention and put in operation in Cincinnati.

While I could expatiate upon various other ideas that are in embryo as yet, and that would be beneficial, I will leave that for some of my brother correspondents to cover.

J. W. RODGERS,
Superintendent of Parks.

Cincinnati, Ohio.

GOLF LINKS

The question of public golf links in the parks of Springfield has been frequently agitated in the public press, but so far the park board has had so many other more important improvements under way that golf links have not been seriously considered. Golf links are rather expensive to establish and to maintain, and as golf appeals mainly to a class with considerable leisure time (it takes about two hours *daylight* to play once round an 18-hole course) the needs of the ordinary population have been considered first. The grounds of the Illinois Country Club are directly adjacent to Washington Park, and if any citizen feels he cannot get along without the privilege of playing golf, he can have the same, with many other advantages, by joining the club. We consider that by establishing public golf links *free*, we would reduce by that much the revenues of the club, and very probably reduce its membership below a paying basis.

The writer was "Captain of the Green" of the Country Club one term and knows that the maintenance of the grounds is an expensive proposition. We had a 9-hole course covering about twenty acres. We kept three men, one boy, and a horse lawn mower going constantly over the ground eight months in the year, besides extra help in the spring, rolling the fair green, and a field mower later, mowing the high grass off the course. The putting greens must be lawn mowed about twice a week, and in dry weather watered every day, or rather every night, as it scalds the grass to water in blazing sunshine, besides interfering with the playing. It took one man all night to get around all nine greens. The fair green was cut above once a week, but it took all the time of the boy with the horse lawn mower to get around in that time. We had no water for the fair green and, on account of being cut so close, the grass burned out in great patches on the hills and dry places, which had to be resodded each spring, as also the bunkers. Weeding and raking the sand in the bunkers

also took a great deal of time. Two thousand dollars a year would be a moderate estimate for maintenance, I think.

The expense of constructing the course would vary widely with the environment, but would be considerably more than the same area improved for ordinary park purposes. There is not only the construction of the putting greens, which are 60 feet square, level as a billiard table, and covered with a close sward of smooth-growing grasses, but the fair green between the holes, 50 yards wide, must be rolled smooth, all the little hillocks knocked down and holes filled up, even those no larger than one's fist. The coarse wild grass must be exterminated as far as possible, and replaced by bluegrass and white clover or other close-growing grasses. Water pipes must be run to each of the putting greens, and if there are not enough natural hazards more must be constructed, with a further cost for maintenance. A club house, of course, is necessary, with lockers and shower baths, but this may be combined with one serving athletic sports generally. Thirty or forty acres of open rolling ground, with few trees—and some natural water hazards if possible—is necessary for a nine-hole course, and proportionately larger for eighteen holes. The golf links should be used for nothing else, and closed to the general public—both for the protection of the player and the innocent bystander—certainly no roads should be run through them. A swift-flying golf ball is about as dangerous a missile as a rifle bullet, also it is very annoying to a foursome out for the blood to yell "fore" until they are hoarse trying to drive daisy pickers off the course.

When we have this much of an area to devote exclusively to golf, and the spare cash to develop and maintain the grounds, we may establish public links, but it seems to me this time is yet far distant.

ARTHUR HAY,
Chief Engineer,

Pleasure Driveway and Park District of Springfield.
Springfield, Ill., February, 1910.

We observe that golf, like many other sports or pastimes, becomes popular with the masses in proportion as it is encouraged. The opportunity for its practice must be created.

Park boards all over the country are just now giving much thought to the feasibility of purchasing larger pieces of suburban ground and holding them in reserve for future use. Such property might be used for golf until such time as the demand called for some other use.

WM. G. MACLEAN.

Madison, Wis., February, 1910.

The golf course at Swope Park is a nine-hole course and covers about one hundred acres. I found it better to mow only part of the course with pony mower and some parts with common hay mowers. This made the game harder to play. About sixty feet at each hole was mowed each week with hand mowers. The tees were graded level.

C. A. CHANDLER.

Kansas City, Mo.

When the West Park Board decided to abolish the race track and the bicycle track in the southern part of Garfield Park it was suggested that a golf link should take their place. The plans, however, were not designed for the purpose of creating a public golf link, but from the viewpoint of making a large meadow on which golf could be played if desirable. The meadow itself is a little less than forty acres and a nine-hole course has been laid out on it. No attempt was made to diminish

the heavy border plantation that was found necessary as a means by which to close out the city bordering close on to the park. This border plantation has given cause for considerable dissatisfaction amongst the golf players on account of stray balls finding their way into the thicket. However, as the first motive was park and the second golf, the plantation has remained as originally planned. A shelter with the necessary rooms for lockers, toilets and the possibilities of a lunch counter was erected in one corner of the meadow. This building would have been necessary to some degree whether golf was played or not, as no public lavatory existed in that part of the park. The course was used by eighteen thousand people from the opening day in August until the closing day around Thanksgiving. During the winter the meadow is used for tobogganing. The expense of maintenance outside the golf starter would compare to the expense of maintaining a good lawn with weekly cutting and continual watering during the dry season. This golf course has no artificial bunkers of any kind and if such should be introduced these bunkers ought to have the appearance of natural hillocks as far as this is possible. The usual shooting or breast work type should not be permitted on the park golf link, indeed ought not to be permitted on any golf link where there is a desire for and appreciation of the beautiful. Forty acres is about the smallest space for nine-hole link. Eighty would be far better and the more rolling the land and the more natural hazards in the way of brooks or ravines the more interesting the play and the more beautiful the surroundings for the players. I never found any trouble in keeping the general public off the links as the open meadow, perhaps, presented little interest to the average city dweller and he therefore would seek those parts of the park that were more in harmony with what he was looking for.

JENS JENSEN,
Superintendent West Parks.

Chicago, Illinois.

We have no public golf course in Saginaw. The Country Club have golf links just outside the city, where the members can enjoy that sport.

It would seem to me there are so few among the masses of the people in a city of this size (about 60,000) who would play golf, and could not afford to belong to the Country Club, that is would hardly pay to establish and maintain, at so great an expense, public links, when we need other things more, that can be used and enjoyed by more of the people.

DANIEL H. ELLIS,
Superintendent of Parks.

Saginaw, Mich., March, 1910.

Our public golf course is a nine-hole course and is in an 80-acre park, which as a matter of fact would be better if twice the size. Although the driveways cross the course at two different points, so far there have been no accidents reported from reckless playing.

The cost of keeping the grounds does not add very much to the general maintenance expense.

We did not alter the general formation of the ground, nor did we make any unnatural hazards, as there are some natural ones, which are preferable. The courses are through some of the plantations, and the shade is highly appreciated.

Anything that might be put in the list of extra expenses on account of the golf links was the fitting up of lockers and shower baths in a new pavilion, which was erected for general accommodation, not only

for golfers, but cricket and baseball players, and also skaters during the winter season. For these lockers a normal price of \$2.50 for the season is charged.

Golf rules are published on page 31 of our Seventeenth Annual Report for the year 1908.

WM. R. ADAMS,
Superintendent of Parks.

Omaha, Nebr., December, 1909.

PLAYGROUND PERMITS

For our baseball and football fields we issue permits every Monday morning for the current week. This practice of giving permits only a week in advance of the time they are to be used is owing to the fact that if no such rule were established all baseball and football grounds would be taken for the entire season at the beginning of the season by those playing regular weekly games, whereas by issuing permits every Monday for the following week including the following Sunday, every one gets a fair chance; the first come, first served.

Tennis court permits are issued by the custodian on the grounds on the day they are used.

CHARLES G. CARPENTER,
Superintendent of Parks.

Milwaukee, Wisconsin.

We have never considered the plan of issuing permits for the use of athletic grounds from the downtown office as practical or satisfactory and have delegated the matter of assigning the grounds to the foreman or caretaker of each individual ground. Charts are kept and time allotted, a reasonable length of time in advance.

If the parties who have reserved the ground fail to put in an appearance at the time allotted the grounds are turned over to whoever may be in waiting.

We find that the man on the ground is in the best position to judge as to who is entitled to the use thereof and from experience knows the character of the teams or organizations, their general deportment, etc., and is in a better position to make a fair and equitable assignment. We have telephones at most of our keepers' residences so that patrons can make arrangements by 'phone in the evening and save a trip to the grounds.

On our busier tennis courts the time is assigned on a daily chart, but in any event we have a standing rule (posted on sign) that the same parties will not be permitted to play more than two successive sets if there are others in waiting.

J. W. THOMPSON,
Superintendent of Parks.

Seattle, Wash., February, 1911.

Our custom is the same as that mentioned by Mr. Thompson, except that the playground instructors issue the permits.

For efficiency and economy it occurs to me that this method cannot be bettered except by providing large areas so that any number of comers can be accommodated at the same time and there is no overlapping duplication.

We have trouble in providing for early and late in the season on turf areas. Our weather is so mild one can play out of doors almost the year

round, and while the turf is yet soft and wet the players want to practice, to the ruination of the grass. It is therefore evident that unless the park is of considerable size the playing must be restricted or the turf abandoned for hard surface pavement such as gravel or cinders.

E. T. MISCHE,
Superintendent of Parks.

Portland, Oregon, February, 1911.

Our present playgrounds consist of three baseball diamonds, three tennis courts, one basket-ball ground and one athletic frame. All are much used and, so far, we have permitted the first comer to occupy the grounds. We hope in the near future to greatly extend our playgrounds, and this will, of course, necessitate a trained director in charge.

GEO. E. VINNEDGE,
Superintendent of Parks.

Fort Worth, Texas, March, 1911.

LAKE WEEDS

In 1909 the park department of Harrisburg, Pa., had a difficult problem on its hands, and the following letters gave suggestions that led to the satisfactory solution of it:

Harrisburg, Pa., June 24, 1909.

DEAR SIR:

Have you had any experience in clearing weeds from a lake or pond in which the depth of water varies from thirty inches to five feet?

Our lake of 140 acres has recently been made as a portion of flood control works. The land was previously wet so that large portions are covered with well established growths of cat-tail, spadder docks and other water-loving plants.

(1) Is there any method of keeping down the weeds till money is available for dredging?

(2) Is there any method of using chemicals with which you have had experience that would be either temporarily or permanently successful?

(3) How does the chemical method compare in effectiveness and cost under conditions with which you are familiar?

(4) Our bottom is loam on stiff clay. Is an endless chain with buckets likely to be a practicable dredge, the existing vegetable growth being considered.

Thanking you for any help you can give.

Sincerely,

F. L. MULFORD,
Superintendent.

DEAR SIR:

In reply to the within, take dry Portland cement and throw broadcast on the waters, quite thickly, twice within one week and once again in a month or six weeks.

This will look very white on the surface of the water, but in a few hours it sinks, leaving the water thoroughly clear and clean and destroys the growth on bottom.

J. CLYDE POWER,
541 S. Broadway, Los Angeles, Cal.

With regard to the problem before you to destroy the water plants in your lake would say that in recent years we have had to contend with a similar growth in all of our lakes and rivers of the water hyacinth. For seven or eight years they almost obstructed navigation. Some five years ago the U. S. Engineer Office in Jacksonville put out a spraying apparatus which had been very successful in cleaning out similar vegetation in Louisiana.

The task before them was so vast, however, that \$30,000 didn't go far, and then there was much opposition to the scheme by the cattlemen whose cows fed on these plants. However, I have great faith in the poison spray, and a letter to the U. S. Engineer Office in Jacksonville, Fla., will elicit the information you desire as to where to obtain chemicals, etc.

Though I was working for the U. S. Engineer Corps at the time I was detailed on other work, so have no actual acquaintance with their methods.

As a matter of interest to you I would say now that the hyacinths are dying out very fast on their own account, having apparently exhausted the waters of their particular brand of plant food. I expect to see the time in a few years when what was a great pest will be one of our curiosities.

My business is that of dredging in muddy lakes, etc., in connection with the excavation of peat, and my opinion is that a small dredge with Hayward Orange peel bucket would be very effective and clean things up over your 140 acres in short time. This and one or two accompanying lighters should not cost more than \$3,000 and be operated for \$14 a day, including fuel. It would cost you almost as much to get ready for spraying with poison.

Always glad to give you any further suggestions in my power.

ROBERT RANSON.

St. Augustine, Fla., June, 1909.

The main conditions in the four questions submitted in regards lakes or ponds have not occurred here. The small lily ponds in Seneca Park which are, or have been, seriously troubled with *algae* or *confervae* are treated with weak applications of sulphate of copper. I think something like ½-pound to one million gallons, and it proves very effective. Of course it has no effect on plants where the cell conditions of life are much more complex.

JOHN DUNBAR,

Assistant Superintendent of Parks.

Rochester, N. Y., June, 1909.

Regarding your inquiry as to methods for keeping weeds out of ponds when not deep enough to prevent them growing, will say that our park ponds were excavated eight feet in depth, the depth which prevents the growth of weeds.

In one pond in which I was interested several years ago we cleaned it with a long chain and rope, hitching on both ends and dropping it into the lake. It was a small lake and the horses could work on the shore. The result was quite satisfactory.

Some thirty years ago I had occasion to deepen a pond of considerable size—or rather it was the inlet which at high tide was overflowed—off the coast of Maryland. At that time we used a drag bucket, a chain and rope being wound up by an upright capstan twenty feet high. It was raised to a platform so as to dump into a wagon without being handled on shore. It was quite satisfactory. We could work two hundred feet off from shore without any trouble and could raise from fifty to one hundred yards a day, according to distance at which we were working. Altogether it was the most satisfactory arrangement I have ever used. I have never

seen a machine constructed like it anywhere else. I think it was the product of a local genius, unpatented, and not on the market.

I have had no experience with chemicals, but my son Arthur, Assistant Superintendent of Parks of Worcester, did have, either last year or the year before, in the pond at Elm Park, Worcester, which was successful. I think if you will communicate with him he will be glad to give you the results of his experience.

G. A. PARKER,
Superintendent of Parks.

Hartford, Conn., June, 1909.

I have never had any experience with chemicals. The only experience I have had was a small lake about one acre. There was an overgrowth of the American lotus and *Typha latifolia*. I mowed the surplus growth down three times that season, and along the shore line several times. The plants gave way to the cutting, so I think if you could get a motor-boat arranged with a sickle bar, like they have on a mowing machine, and mow the water plants down several times during the season the plants will give way to the cutting. After once cut keep the air from them.

O. E. WOLFF,
Park Superintendent.

Cedar Rapids, Iowa, July, 1909.

UNITED STATES DEPARTMENT OF AGRICULTURE,
Bureau of Plant Industry.

Washington, D. C., June 30, 1909.

MR. F. L. MULFORD,
Superintendent, Water Works,
Harrisburg, Pa.

I regret to inform you that water weeds are very resistant to chemical treatment. It is impracticable to attempt the eradication of such weeds as you mention in your letter by the application of chemicals, and I know of no means of keeping them down except by dredging.

KARL F. KELLERMAN,
Physiologist in Charge.

We have never had any ponds to deal with in our department, so could not give you a very detailed reply to your question, but I should try and keep the weeds down by mowing often, particularly in the month of August, which will have a tendency to kill and will check the growth.

I do not know of any chemical you could use under water to kill water plants. Where no water stands on the surface salt will kill to a certain degree, but would have to be used in large quantities to accomplish any results.

I fear the endless chain dredge would be a failure among the vegetable growth, as your chain would naturally clog up all the time. A scow with steam dredge would be the only sure method to insure good results.

O. N. STRAITE,
Superintendent of Parks.

Binghamton, N. Y., June, 1909.

One hundred and forty acres of water of a depth of 30 inches to 5 feet, and well colonized with aquatic plants, is a hard proposition to clear from the plants. I have cleared ponds of that depth of the canal weed (*Ana-*

charis canadensis and *Potomagetums*) by the use of a horse rake and two horses, but 140 acres—that is another story.

I know of no chemicals that will kill such perfected organisms. Sulphate of copper will kill the lower ones, but such weeds as I have indicated are proof against them.

I have had in mind, if ever the occasion arose, that I would experiment with a scow on which machinery could be placed to run a gigantic weed cutter, on the principle of the Deering mower, below the water. If weeds can be cut off below the surface of the water frequently they will die, as even couch grass will die if cut off below the surface of the ground frequently.

J. A. PETTIGREW,
Superintendent of Parks.

Boston, Mass., June, 1909.

You asked me the question with regard to the keeping down of cat-tails, spadder docks, and sagitaria, etc., in shallow ponds. I have found that cutting them at the latter end of July or the beginning of August with a scythe as close to the bottom as possible to be very effective, which should be done by a man with waders and scythe, where the water is shallow enough for it to be done in this manner. Some places where I have had this done three years ago they have never made their appearance. Chemicals, I don't think, would have any effect where the plants are rooted in the soil.

WM. R. ADAMS,
Superintendent of Parks.

Omaha, Nebr., July, 1909.

We do not use chemicals and do not consider it effective, nor is the dredging method permanent, as in a short time the weeds return. We are sending under separate cover today a blue print of a boat designed for weed cutting purposes, which we believe is about the best and most practical proposition we have ever worked upon for this purpose.

Conditions vary with years, and some summers the growth of weeds is extraordinarily heavy and the matter should have constant attention, while other seasons the conditions may be such that there is very little of this work to do.

H. S. RICHARDS,
Assistant Superintendent South Parks.

Chicago, Ill., July, 1909.

We have had considerable experience in cleaning weeds from lakes. Most of our lakes have a depth of from five to eight feet and in some places more. We have heretofore used scows and men with rakes. We are now considering a boat, with machinery for propelling and operating a sickle. Some years ago we tried a boat of this kind, but without success. However, we hope to get better results now. We have not tried chemicals.

Some years the growth of weeds in water is very great; this year, for instance; other years it is not heavy. Our lakes have all been excavated and all loam removed. In some places a clay bottom exists, but in most places the bottom is sand.

A dredge will probably remove the difficulty for a couple of years or so, but it is sure to return.

J. F. FOSTER,
General Superintendent South Parks.

Chicago, Ill., July, 1909.

Regarding weeding your lake, I think that if you had a machine similar to the one I have constructed for the lake in the West Park System you would be able to keep your weeds down. The machine consists of a small barge with a gasoline motor and a sickle bar attachment on one side of the barge, and it is propelled by a stern wheel. I think the whole affair cost us something like \$350 to \$400. It is my idea and I experimented with the construction for a while before we got what we wanted, and this, of course, increased the cost of the construction. If you have a copy of our last year's annual report you can see a photo of it; the *American Florist* also had a photo of it some time last summer.

JENS JENSEN.

Chicago, Ill., June, 1909.

I have had a little experience with weeds. In the early days when our lakes were started we had trouble with the same weeds referred to. We put a gang of men in the water with scythes and mowed them down. Eventually they disappeared. Owing to the deep water I have had no experience with chemicals. About twelve years ago we had an attack of a very bad weed—I can't name it—with a real fine stem. It made boating very unpleasant. We experimented for three years with ways of taking them out. At the conclusion we had to build rafts and put a gang of men on them with strong rakes and pull the weeds on the rafts, then dump them on shore and cart them away. We had to keep that up for three summers, then we had the lake dredged, but we had the best of the weeds by that time.

In my opinion, if you can let your lake down low enough to mow with scythes it will answer the purpose till you dredge it. We mowed in between three and four feet of water.

WM. DONALDSON,
Assistant Superintendent of Parks.

Buffalo, N. Y., June, 1909.

The manner we have used was to cut the weeds below the water and as they grew up again repeat the operation and a few times going over will kill them. This applies to all classes of plant growth in water.

J. G. MORLEY,
Superintendent of Parks.

Los Angeles, Cal., July, 1909.

To remove cat-tails and spadderocks, use concentrated lye at the roots of plants. Drain the lake in fall of the year. A good freeze of about two weeks, with lake drained, will keep the weeds down for one year. These are the only methods we know of, beside weed-killer, which is too expensive.

PHILIP C. SCANLAN,
Park Commissioner.

St. Louis, Mo., June, 1909.

After receiving the foregoing letters we made sketches of a scow to carry mowing machine knives, driven by a gasoline engine, and obtained figures for its construction and equipment, feeling this was the most promising chance for success. Before ordering construction we heard, through the State Fisheries Department, of a patent weed-saw that seemed as though it might possibly help us. We asked the park people at Toledo to report a demonstration that was being made there, and on the strength of that report purchased fifty yards of the saw. This saw is not over

three-sixteenths of an inch wide, and thin, with teeth at $\frac{3}{8}$ -inch intervals on each side. It is weighted at each end by special weights and has a long rope attached to each end by a swivel. The saw is drawn backward and forward on or near the bottom by a man, or men, at each end. The first impression was it was too light for any serious work.

Before the saw came we had been working at the weeds in every way we could. Where possible we mowed with a scythe, in the shallow places, by walking on the bottom; in the deeper places, from a scow. Some of the finer grasses we tried to pull out with a rake, and with a fair degree of success, judged by the removal of large quantities of material. The net result of our labors was that by the time the saw arrived, about the first of August, the lake looked like a meadow. At a little distance no one would think there was any water there. It was possible to pole a boat through it. In attempting to row through, the weeds were so thick that the boat would come to a standstill between the strokes. This condition existed over all the lake but possibly twenty acres.

On August first we started the saw, without confidence in its ability to do the work. After half a day we concluded we had misjudged it. Where the bottom was free from obstructions it cut rapidly. It found all the snags and without breaking. One of the first things we did was to saw two inches into the end of a railroad tie. We got it out without breaking the saw. Later experience proved that in case of a break in the saw it could be easily repaired by lapping the ends and winding with fine wire. One hundred yards of saw was all four men could handle well in heavy cutting. We used scows to work from in the middle of the lake. As there was no current to carry the cut weeds off it was necessary to work against the wind to keep the cut weeds from interfering. There was but one small area where the weeds did not float away as fast as cut. In most places we could tell whether or not the saw was working properly by the falling over of the cut weeds. They usually rose some distance into the air before falling, giving the impression of being shot up. In the case of plants whose leaves rested on the water it was only the young growth that had not yet reached the surface that behaved in this way. Tons of cut material had to be dragged out on the bank wherever it drifted ashore. Because of the many snags found this first summer the work was slow, but later experience has demonstrated that the lake may be entirely cut over in eight days or less.

The lake was all cut over in August and a large portion again in September. The second growth in no place was over 15 per cent as heavy as the first growth. In June the following year one cutting was made but the growth was light and in many spots there was none. We fully expected a second growth, but those who attended our convention last summer will remember what a poor demonstration we could give of the working of the saw because of lack of growth to cut.

The saw is known as Ziemsen's weedcutter, and is manufactured in Germany. It is handled by Aschert Bros., of Milwaukee, Wis.

F. L. MULFORD,
Superintendent of Parks.

Harrisburg, Pa., October, 1910.

WHITE OAK DISEASE

Nearly all of the many white oaks (*Quercus alba*) in Beardsley Park and that section of the city were peculiarly affected last spring by a strange disease or condition that gave us some alarm. The foliage, when one-half or two-thirds developed, looked as if it had been badly frozen or had been attacked by the wood aphid, causing some of the leaves to roll their edges in and becoming so dry that they would powder up on handling, and nearly all the foliage had a yellowish, sickly look. Some of the

lower limbs failed to recover from it, and had to be taken off. The lower portions of the tree were affected most. Was it caused by the unusually cloudy and dark period, preventing them from obtaining a sufficient supply of carbon or some other ingredient, or is this variety of tree to be affected the same as the old buttonball (*Platanus*) or the locust (*Robinia*)?

CHAS. E. KEITH,
Superintendent of Parks.

Bridgeport, Conn., 1902.

I have noted, with regret, the trouble spoken of by Mr. Keith, on the white oak. I attribute it to fungus, and notice it to be more prevalent in wet seasons than in dry ones. I intend having the matter looked into by a specialist next season, although I fear there will be no practical remedy for it.

J. A. PETTIGREW,
Superintendent of Parks.

Boston, Mass., 1902.

I have noticed the trouble with the white oak leaves for two or three seasons on some of the oaks here, but it is not by any means general. If it were not so late in the season when it strikes the trees I should say that they had been touched by a frost. I think it is caused by damp weather when the leaves are about half unfolded.

JOSEPH D. FITTS,
Superintendent of Parks.

Providence, R. I., 1902.

MOLES

Can anyone tell how to get rid of moles?

Will the planting of castor beans (*Ricinus*) keep them away? Is it feasible to poison earthworms with strychnine, and place them in their runs?

Do you have any luck with traps?

We have caught hundreds of them by watching for them at work and giving them the heel of the boot.

CHAS. E. KEITH,
Superintendent of Parks.

Bridgeport, Conn., 1902.

A figure of 4 trap will work while you sleep. The fall may be a board 6 feet long and 4 inches wide. On top place two bricks, the trigger trained on to a small section of the run pressed down solid; over the trigger a small block of wood filled with long, fine spikes, placed so that the deadfall will drive the spikes into the run when the mole raises the obstruction in his run.

It is a good thing for moles—or rather bad, I should say, looking at it from their standpoint. I know from experience.

J. A. PETTIGREW,
Superintendent of Parks.

Boston, Mass., 1902.

The ground mole caused us quite a little trouble two years ago, and last year they were in Elmwood Park, which, being new, was undoubtedly the reason they were more plentiful there than elsewhere. I found the boot heel quite effective, but better still, the manure fork. These methods not being entirely satisfactory, I thought of my boyhood days when I used to drown out woodchucks. This remedy was a success as far as I could apply it.

A. P. CAPEN,
Superintendent of Parks.

Holyoke, Mass., 1902.

Carbon bisulphide placed in the burrow often proves most effective. It should be remembered when using this poison that it is as explosive as gasoline.

EDWARD P. ADAMS,
Engineer of Parks.

Medford, Mass., 1902.

Instead of the trap recommended by Mr. Pettigrew would it not be better to use a trap like the Hale or Reddick? They are both cheap, simple, and will do their work well, and if a little study is given to the habits of the mole a person will soon become an expert at trapping them.

JOHN W. DUNCAN,
Assistant Superintendent of Parks.

Boston, Mass., 1902.

PARK BOARD ORGANIZATION

The most important occurrence with us during the year is the taking of the park department out of politics and placing it by a State legislative act and the majority vote of the city in a department by itself, copying Hartford's scheme with the exception of two less Commissioners. A Commission of eight men, one retiring each year and his successor appointed by the remaining seven Commissioners, making sure of the selection of a new Commissioner who is and will continue to be interested with his colleagues in the advancement and beautifying of the public parks and to the preservation and enlargement of these grounds and belongings, which are intended for the use of *all* the people and for the betterment of their health and happiness. The Commissioners are given full power to add to, build up and to so direct the expenditure of all monies in such a manner that it will redound to the best interests of the city. This Commission will see to it that no dollar is used without the city getting its full equivalent. Under the old system it was possible for a mayor, through his appointments, the city fathers, or the ever-present active politicians, to so manipulate matters that more or less of the appropriation allotted to the park board could be perverted and used for the paying of good but useless constituents of those same peanut politicians. The park boards of many cities have projects come before them that would require several years to complete, that would be of great benefit to their city, but do not enter upon them because of the probable chance that the incoming administration would displace them; but a board of eight years with an assurance that no one will interfere with them will not hesitate to start at once, and become interested in and give much of their time and means for its completion. And I am fully of the belief that the first political head that introduces itself into our board will get a blow for fair and put a stop to any other repetition.

The severe drouth of last summer compelled us to use large quantities

of water upon our young trees and shrub plantings and some of the trees in dry situations.

We also used several tons of land plaster to the benefit of our lawns and fields. The early coming and the abundance of the fall rains caused all vegetable matter to quickly recover itself and be restored to its usual good condition.

CHARLES E. KEITH.

November, 1907.

RECORDS OF THE YEAR'S EXPERIENCE

In the construction of a park in Medford, where clay pits had been, the filling was done almost entirely with ashes. To prevent the ashes draining the surfacing of loam too rapidly, we spread and rolled on top of the ashes a 2-inch layer of yellow clayey loam, before spreading the surfacing of black loam.

In leveling the ashes the most effective way was found to be by horse scraper, the hardened surface first being loosened with picks.

The shrinkage of loam when rolled caused considerable extra expense. The shrinkage from cart measurement was in this case over 40 per cent. A part of this was due to the uneven settlement, which required additional loam in places to keep the surface to proper grade.

A temporary boundary fence being needed to protect the most exposed part of the seeded ground until a sod could be grown, an attractive fence was made at small expense with 3-inch by 4-inch spruce posts, with two bands of 2-inch panel wire fencing 13 inches apart and 13 inches from the ground. The top of the posts were cut on a slant to shed the rain and prevent rotting. The corner posts were pointed and braced with 2-inch by 3-inch spruce. The end posts away from entrances were braced by telegraph wire carried down diagonally and fastened to a short post at the ground.

EDWARD P. ADAMS,

Engineer of Parks.

Medford, Mass., January, 1908.

GUTTERS FOR MACADAM ROADS

I will tell you briefly what we do in this line in Milwaukee for our park roads:

All of our drives are covered with macadam pavement, and are from 20 feet to 36 feet in width. On each side there is a gutter, and we are now making them of vitrified brick laid flat and lengthways of the gutter, which is from five to seven bricks wide, depending upon the probable amount of water. The gutter is begun at the lower end and is made by first shaping the bed perfectly so the bottom is about three inches lower than the edges. Then one or two inches of sand is spread—in fact, as little as possible. The bricks are laid even and close and lightly rammed. On the roadside the macadam is finished even with the top of the bricks and well rammed, and on the park side sod is laid close to the outer edge of the gutter. This gutter is very serviceable, durable and easily made.

The catch basins are placed in the bottom of the gutter. The basins are of cast iron, in two pieces, and the cover or grate is 15 inches by 22 inches in size and curved to fit the curve of the invert of the gutter. This cover fits in the top of a funnel-shaped casting, which is set into

the bell of a 12-inch sewer pipe placed vertically. A second section of 12-inch sewer pipe, containing an 8-inch tee outlet completes the catch basin, which is connected with the sewer.

CHARLES G. CARPENTER.

Milwaukee, Wis., January, 1909.

CONSTRUCTING ROADS IN BOGLANDS—GUTTERS—SOD AND CONCRETE

I have had no actual experience in road building through actual bog land, as any problems of this kind in my work, have always been solved by first draining the bog.

In Eastern Canada, many roads are built through bogs by laying logs crossways close together. A little gravel or earth is spread on top to fill the interstices and give foothold for horses.

These corduroy roads, as they are called, are satisfactory and last a number of years. A road of this description would be of little use where traffic is heavy and continuous, but would be satisfactory for light vehicular traffic.

Sod gutters are effective and are very inexpensive to construct, in comparison with brick, concrete or cobblestone, though I prefer the latter, where expense is not considered.

In making a sod gutter, see that it is wide and shallow enough to run a mowing machine along sides and bottom. In this way a sod gutter can be kept clean and tidy enough to be a finish to the sides of even a well-kept parkway. Where gradients are steep, sod gutters are not satisfactory, as the turf is unable to withstand the continual washing.

On the gravel drives of our parks we use 12-inch square gratings and catch basins, connected with 4-inch drain pipes. These are placed close to the edge of drive, about 100 feet apart, alternately, without any gutters, and we find this takes care of all the surface water without washing. The grades are, however, very easy.

G. CHAMPION,

Superintendent of Parks.

Winnipeg, Canada.

My experience in making driveways through bog lands has been to the good, because of the close proximity of old stone fences and good gravel banks which we used for the drive after we had taken out its fertile soil.

CHAS. E. KEITH,

Superintendent of Parks.

Bridgeport, Conn.

SKATING AREAS

Does it pay to spoil a field of summer sports by flooding it in winter for skating? This is the complaint of the ball players regarding Franklin Field in Boston. With Jamaica Pond so near it does seem unnecessary to make Franklin Field spongy all the year round.

To those who have not had experience in making ice by spraying for skating on a lawn, it is well to caution them to begin slowly so as not to thaw the surface of the frozen ground. After an inch layer of ice has been formed the water can be used more rapidly. Daily spraying (early in the morning or, better, late at night) will obviate planing the surface and make smooth ice.

EDWARD P. ADAMS.

Medford, Mass., September, 1907.

BRUSH BURNING

As to cleaning up wooded areas and burning the brush, I would state my experience at Keney Park: There is here nearly two hundred acres of wooded area, and four years ago the process of cleaning up rubbish and cutting out dead trees began. As the woods had never been cleaned before, the amount of material gathered was astonishing. A small stream runs through the woods, besides some sixty small pond holes, so there was an abundance of water conveniently at hand. The burning places were near water, and enough water was applied to the fire to keep the flames very low. I was surprised at the amount of water needed and how apparently under control the fire could be kept, and yet burn the brush. Probably in no case was a tree of any size nearer than fifteen feet from the outer rim of the fire, and at no time was it uncomfortably warm for a person to stand by the trees. At the time it did not seem to be at all injurious to the trees, nor did I notice any appearance of injury for over a year, and at that time I felt satisfied I had found a method of successfully burning the brush inside the woods; but the second or third year, much to my surprise, I found either strips of dead bark or where the bark had fallen from the trunks from 4 to 10 inches wide and 6 to 12 feet long, with a healthy, healing callous rolling over the wound. At first I tried to convince myself that the fire had nothing to do with it, but as they were around the burning places and nowhere else, there was no other conclusion to come to but that the fire caused the injury.

This is my theory as to how it was done: At no time was any tree so warm as to feel more than warm to the hand; therefore, the trees were not scorched, but as openings large enough for the fire and near water were so far apart, and the quantity of brush so large, the fires were kept burning for two or three days in one place, and the continual warming, at last weakened, by evaporation or otherwise, the living cells so they died the following season, even if they were not killed outright at the time. In the same way a tree sometimes becomes sun-scalded where the trunk is exposed to the two o'clock sun in the summer, the theory here being also that it is a drying-out process.

Now I burn nothing in the woods, but everything is carried to a sand pit or other open area to be burned. The present method of carrying is on a wide stone-boat, on the top of which and across each end is fastened a good-sized stick with holes for stakes. This makes a rig easy to load, with only one man handling, as each man puts his armful directly onto the load. It is also quickly unloaded, for by taking out the stakes next the fire, then with two long poles under the brush it is rolled off at once and into the fire.

The brush in going over the underbrush in the woods apparently does not the least damage, for the width of the boat distributes the load so no shrubs are broken, and all rise up again as soon as the boat passes. Still, I would not dare to say no damage is done until the next growing season has passed. The boat has only been in use this last winter. It certainly is better than a cart. It leaves no ruts and it can go anywhere that the horses can go, for two drag ropes attached to rings in the rear corners enable men to slue the boat to clear trees if necessary.

G. A. PARKER,
Hartford, Conn., April, 1901. Superintendent Keney Park.

To avoid the expense of carting limbs and bushes to a pit, we have burned them where cut when the wind was light and soon after a rain, or when there was a light fall of snow on the ground. The winter of 1900-1901 was so favorable for such work that we thinned out a surplus of old trees, mostly of sprout growth of oak, producing 130 cords of wood for the market, and burnt all the brush where cut, on 15 to 20 acres of land. We have followed this method for ten years; by using care in selecting places for burning very few trees have been injured by the fires.

Some winters have been so unfavorable for burning brush where cut that carting had to be resorted to.

A lot of 50 acres had about 2,500 large white pine trees standing in December, 1899, when a high southwest wind broke off 15 to 20 of trees, 6 to 12 inches in diameter, 5 to 12 feet from the ground. An examination of the breaks showed that on the southerly side of the trunk of all the fallen trees the bark was dead up and down the trunk for several feet, and the sap wood some inches in thickness under the bark had begun to decay. Cross-sections showed that the trees had made one year's growth on all live parts since the damage was done. After consulting Prof. B. E. Fernow, we became convinced that the injury to the trees was caused by burning of the sun and winds during three consecutive days of excessively hot south winds of August, 1898, after a long spell of very dry weather. During those three days of hot winds leaves of oaks and of some other trees and shrubs in exposed places were withered and burned beyond recovery.

Plymouth, Mass., April, 1901.

NATHANIEL MORTON,
Chairman Park Commission.

The rhododendrons, retinisporas and arborvitæ of most varieties have suffered more injury this season than for many years in this vicinity. Some are wholly ruined, while others are more or less burned.

The winter has not been severe, and I should like the views of members on the probable cause of this state of affairs.

Worcester, Mass., May, 1901.

JAMES DRAPER,
Secretary Park Board.

I have noticed an unusual amount of damage to evergreens by cold, the past winter. I have supposed it was due to cold weather without snow.

JOHN C. OLMSTED.

The damage to trees and shrubs during the past winter was, I think, due to two causes: the great drouth of last summer and the protracted dry cold of the latter part of January and the whole of February of this year. The one succeeding the other evaporated the life of the plants. Woody plants could not ripen their summer's growth from lack of moisture, and easily fell victims when frozen dry in winter.

In Boston and neighborhood many plants considered perfectly hardy were either killed or badly injured. For instance, the pepper bush (*Clethra alnifolia*), *Cornus canadensis*, *Cornus Florida*, hemlock spruce (*Abies canadensis*), and even the wild rose (*Rosa lucida*). Many of the above-named plants are perfectly hardy where the thermometer falls lower than it does in Boston; and when the damage extended, as it did here, to oaks, hickories and chestnuts, I am led to think that the previous summer's drought was the primary cause of the trouble.

Boston, Mass., June, 1901.

J. A. PETTIGREW,
Superintendent of Parks.

Nearly all of the rhododendrons and kalmias with us have recovered from the general bad condition they were in last spring. Many that were exposed to the sun lost most of their leaves and buds, and we thought they were lost; but they have made a new, vigorous growth, and seemingly are enjoying life again. I have thought that the very cold weather during last February filled the foliage with frost and the morning sun being quite warm destroyed most of the foliage it reached; while those plants that were shielded more or less from the sun's rays were not affected at all.

I think the warm sun and weather during winter does much more damage to our ornamental stock than excessive cold, and in protecting them, let it be from the sun.

Bridgeport, Conn., June, 1901.

CHARLES E. KEITH,
Superintendent of Parks.

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BULLETIN 11

American Association of Park Superintendents

February 1914



Insects Injurious to Shade and
Ornamental Trees

UNIVERSITY OF ILLINOIS
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CONTENTS.

	PAGE
Foreword	4
Leopard Moth	5
Elm Leaf Beetle	5
Hickory Bark-Borer	6
Gypsy Moth	6
Brown Tail Moth	7
Red Spider	8
Bronze Birch Borer	8
Scurfy Scale	9
Flat-Headed Borer	9
Cotton Maple Scale	10
Bagworm	11
Fall Web-Worm	11
San José Scale	12
Aphids	12
Elm Borer	13
Tent Caterpillar	14
Maple Leaf Scale, Maple Phenococcus.....	14
Black-Banded Scale	15
Poplar Borer	15
Spring Elm Caterpillar	16
Maple Borer	16
Syringa Borer	17
Oak Clytus	17
Small Ermine Moth	17
Fir Saw Fly	18
Walnut Bark Borer	18
Western Blister Beetle	18
Elm Leaf Louse	18
White Fly	19
Wooly Elm Leaf Aphid	19
Cherry Tree Slug	19
Locust Borer	19
Walnut Caterpillar.....	20
Spring Canker Worm	20
Other Insects Reported	20
Some Literature on Insects Injurious to Trees.....	21

FOREWORD.

During the 1912 meeting of the Association at Boston, a Tree Committee was appointed consisting of Messrs. Hermann W. Merkel, F. L. Mulford, and J. J. Levison. The committee asked all members for reports on the most important insect pests found in their respective cities. The replies came in generously and the following compilation is the result.

In order to use this bulletin with ease it will be necessary to note that the insects mentioned have been arranged in the order of their economic importance. Under each of the insects considered are mentioned the cities reporting on that particular insect and the remarks made by each of the persons reporting. Each city is given an arbitrary number and the various remarks credited to their respective numbers.

In this way one can now readily obtain a clear idea of the important insect pests confronting the Park Superintendents of America and the methods employed by them toward the eradication of these pests. One can also see how near these pests are to his own territory and how injurious any particular insect enemy has proven in a locality. He can trace each insect to the person who actually had to combat it and, if necessary, obtain his information first hand by writing to the person responsible for any particular remark in the bulletin. The bulletin, therefore, ought to serve a practical purpose uncomparable to any other literature on the subject. With the hope that it will have this practical value, it is submitted to the members.

Special mention should be made of the untiring efforts of Mr. Hermann W. Merkel who, as member of the Tree Committee, did practically all the compiling from the original notes submitted by the members. The colored plates of the Gipsy and Brown-tail moths were furnished by the Department of Agriculture of the State of New York through the kindness of Mr. George W. Atwood, Chief of the Bureau of Horticulture and Nursery Inspection.

J. J. LEVISON,
Chairman, Tree Committee.

LEOPARD MOTH (*Zeuzera pyrina*).

Handsome white-and-black-spotted moth, flying from June to September. Laying eggs in bark crevices or on twigs.

Larvæ enter trees and feed on wood for nearly two years.

LEOPARD MOTH—Reported from:—1. New Haven, Conn.

2. Brooklyn, N. Y. 3. Lawrence, Mass.

Condition:—Serious: City No. 1.

Food:—Elms, silver maple, etc., City No. 1 and No. 2.

Active:—May to October, City No. 1 and No. 2.

Remedy:—Pruning of infested branches, carbon. bisulphide, City No. 1 and No. 2.

Time of treatment:—Summer and fall, Cities No. 1 and No. 2.

ELM LEAF BEETLE (*Galerucelea luteola*).

Small beetle of European origin. Yellowish, with dark stripe on each wing cover.

Winters in adult state, flying to elms as soon as leaves develop, biting holes through them.

Yellow eggs laid in clusters on under side of leaves, hatching in a week or ten days.

Larva feed on under side of leaves.

Pupate in crevices of trunk or other hiding places.

ELM LEAF BEETLE—Reported from:—1. New Haven,

Conn. 2. Boston, Mass. 3. Worcester, Mass. 4.

Fitchburg, Mass. 5. Brooklyn, N. Y. 6. Lowell, Mass.

7. Manchester, N. H. 8. Providence, R. I. 9. Albany,

N. Y. 10. Lawrence, Mass. 11. Hartford, Conn. 12.

Reading, Pa. 13. Newburg, N. Y. 14. New Britain,

Conn. 15. N. Y. Zoological Park, N. Y. City.

Condition:—Serious: Cities No. 1, 2, 4, 5, 6, 7, 8, 9, 10, 13, 14, 15.

Food:—Elms, all cities mentioned.

Active:—June and July, Cities No. 1, 3, 7, 9, 14. May and June, Cities No. 5, 15. May to July, Cities No. 2, 10. June to late August, City No. 4. Early summer, City No. 13.

Remedy:—Arsenate of lead, Cities No. 1, 2, 4, 5, 6, 7, 8, 9, 10, 13, 14, 15. Kerosene emulsion, Cities No. 1, 2, 6. Hot water or oil in August for pupæ, City No. 5.

Collect and burn pupæ in August, beetles in winter, City No. 5.

Time of treatment:—May and June, City No. 1, 14. May for beetle, City No. 5. June for larvæ, City No. 5. June, City No. 9. May to July, City No. 10. First half of June, City No. 13. When active, City No. 15. General spring and summer treatment throughout.

HICKORY BARK-BORER (*Scolytus quadrispinosus*).

Small brownish-black beetle, with very large thorax and concave posterior, feeding on hickory buds and causing dropping of leaves.

Passes winter in larva state, emerging from bark through numerous small holes in June and July.

Adults enter hickory trees in July and August, drilling vertical upward passages. Larval galleries start at right angle to parent ones, soon girdling trees.

HICKORY BARK-BORER—Reported from:—1. Cleveland, O. 2. Terre Haute, Ind. 3. Brooklyn, N. Y. 4. N. Y. Zoological Park, N. Y. City.

Condition:—Serious: Cities No. 2, 4.

Food:—All hickories, Cities No. 3, 4.

Active:—June, Cities No. 1, 2. September and June, City No. 2. Summer, City No. 4.

Remedy:—Cut out and burn, City No. 3. Destruction of hosts, City No. 4.

Time of treatment:—Any time when observed, City No. 3. Entire year, City No. 4.

GYPSY MOTH (*Portheria dispar*).

Male—Olive brown with black markings.

Female—Larger and paler, has wings but does not fly.

Winter passed in egg state in masses, hatching in late April and early June.

Moths appear in late June and July.

Caterpillars feed mostly at night and will defoliate whole forests.

GYPSY MOTH—Reported from:—1. Boston, Mass. 2. Worcester, Mass. 3. Fitchburg, Mass. 4. Portland, Me. 5. Lowell, Mass. 6. Manchester, N. H. 7. Providence, R. I. 8. Lawrence, Mass.

Condition:—Serious: Cities No. 1, 2, 3, 5, 6, 7. Traces, City No. 4.

Food:—All trees and shrubs, Cities No. 1, 2, 3, 6. All fruit and shade trees, City No. 8.

Active:—June 1st to July 15th, City No. 6. May 1st to August 1st, City No. 5. May to September, City No. 8.

Remedy:—Arsenate of lead, Cities No. 1, 2, 3, 5, 6, 8. Winter, cresote, City No. 1, 2, 3, 5, 6, 8. Wilt disease, City No. 2. Wilt disease, City No. 8, successful in this section. Burlapping with Tanglefoot, Cities No. 1, 3. Close cavities and cut undesirable species, City No. 3.

Time of treatment:—September to May, City No. 3. Fall, winter, spring, Cities No. 6, 8.

BROWN-TAIL MOTH (*Euproctis chrysorrhoea*).

Adult Moths—White with brown anal tuft.

Passes the winter in caterpillar stage in nests made of leaves and silk, emerging very early in spring, and feeding voraciously on buds and foliage.

Pupate early in June; moths appear soon after.

Confined at present to New England States.

Reported from:—1. Boston, Mass. 2. Worcester, Mass., 3. Fitchburg, Mass. 4. Portland, Me. 5. Lowell, Mass. 6. Manchester, N. H. 7. Providence, R. I. 8. Lawrence, Mass.

Condition:—Serious: Cities No. 1, 3, 4, 5, 6, 8.

Food Plants:—Nearly all trees and shrubs, Cities No. 1, 2, 3, 5. Preferably fruit trees, City No. 3. Oak trees, Cities, No. 4, 5, 6. Elms, Cities No. 4, 5. Maples, Cities, No. 4, 6. Birches, City No. 4. All deciduous trees and conifers, City No. 8.

Active:—Spring to July and early September, City No. 1. April 15th to July 1st. City No. 2. April 10th to June 15th, City No. 3. May to August, City No. 4. May and June, City No. 6. May 1st to September 1st, City No. 8.

Remedy:—Spray, arsenate of lead, cities No. 2, 3, 4, 5, 6, 8. Spray, arsenate of lead first week in August, Cities No. 2, 3. Cutting of nests, Cities No. 1, 4, 5, 6, 8. Burlapping, Cities 1, 5. Callosoma Beetle, City No. 8.

Time of treatment:—Spring, Cities No. 2, 3, 4, 5, 6, 8. First week August, Cities No. 2, 3. Winter, Cities No. 1, 4, 5, 6, 8. Fall, City No. 8.

RED SPIDER (*Tetranychus*).

A minute red spider mite of several species, living mostly on underside of leaves, spinning a protective net.

Eggs—Small glistening, transparent globules.

RED SPIDER—Reported from:—1. Pittsburgh, Pa. 2. Pueblo, Col. 3. Colorado Springs, Col. 4. Chicago, Ill. 5. Topeka, Kan. 6. Tacoma, Wash. 7. Minneapolis, Minn. 8. Portland, Oregon.

Condition:—Serious: City No. 5.

Food:—Willows and Elms, City No. 2. Blue spruce and Red Cedar, City No. 5. Fruit Trees, City No. 6.

Active:—June and July, Cities No. 5, 6.

Remedy:—High-pressure clear water spray only successful way, City No. 5. Spray with nicotine, City No. 6.

Time of treatment:—June and July, City No. 5. Early spring, City No. 6.

BRONZE BIRCH BORER (*Agryllis auxius*).

Dark bronze beetle nearly one-half inch long.

Eggs laid in June and July.

Larvæ flat legless, boring under bark, later entering wood.

BRONZE BIRCH BORER—Reported from:—1. Niagara, Canada. 2. Cleveland, O. 3. Minneapolis, Minn.

Condition:—Serious: City No. 1.

Food:—Birches.

Active:—May and June.

Remedy:—Destruction of hosts.

Time of treatment:—Any time.

SCURFY SCALE (*Chionapsis furfura*).

Small elongated scale.

Winters in egg state under dead female.

Young—Active, reddish purple.

SCURFY SCALE—Reported from:—1. Brooklyn, N. Y. 2. Chicago, Ill. 3. Toledo, O. 4. Minneapolis, Minn.

Condition:—Serious: City No. 3.

Food:—Elm, ash, shrubs, City No. 3.

Active:—Summer, City No. 3.

Remedy:—Lime sulphur, kerosene, emulsion, City No. 3.

Time of treatment:—Winter and summer.

FLAT-HEADED BORER (*Chrysobostris femorata*).

Beetles dark, $\frac{1}{2}$ inch to $\frac{5}{8}$ inch long.

Eggs laid on bark. Legless flat-headed larvæ bore into and feed on sap wood, making wide shallow gangways.

Pupates late following spring, beetles emerging about June 30th.

FLAT-HEADED BORER—Reported from:—1. Denver, Col. 2. Ft. Worth, Tex. 3. St. Louis, Mo. 4. Westchester Co., N. Y.

Condition:—Serious: Cities 1, 2, 3, 4.

Food:—Maple, City No. 2. Sycamore, Cities No. 2, 3. Hackberry, City No. 2. Elm, City No. 2. Soft maple, White elm, Carolina poplar, City No. 3. Hemlock, City No. 4.

Active:—Early summer, City No. 1. July, August, September, City No. 2. July to October, City No. 3.

Remedy:—Cut out infested area and cover with tar, Cities No 1, 3. Pick out larvæ then apply carbolic solution, City No. 2. Scrape off bark and pick out larvæ, City No. 2. Bisulphide of carbon, City No. 3. Cut down and fell or burn infested trees, City No. 4.

Time of treatment:—Summer, City No 1. July to October, City No. 3.

COTTONY MAPLE SCALE (*Pulvinaria innumerabilis*).

Small yellowish-green, later brown scale, covered with cottony secretions when adult.

Infests underside of leaves and branches, usually present in immense numbers.

COTTONY MAPLE SCALE (*Pulvinaria*)—Reported from:
—1. Denver, Col. 2. New Haven, Conn. 3. Pueblo, Col. 4. Salt Lake City, Utah. 5. Colorado Springs, Col. 6. Chicago, Ill. 7. Columbia, Mo. 8. Milwaukee, Wis. 9. Toledo, O. 10. Minneapolis, Minn. 11. Newburg, N. Y. 12. Grand Rapids, Mich.

Condition:—Serious: Cities No. 1, 3, 5, 6. Not Serious, Cities No. 8, 9.

Food:—Soft maple, Cities No. 1, 4, 5, 6, 9. Black locust, Cities, No. 1, 5. Carolina poplar, City No. 10. Box elder, Cities No. 3, 4, 5, 6. Lindens, City No. 5. Ash, City No. 6.

Active:—Summer, Cities No. 1, 9. Spring to June, City No. 6. June to July, City No. 5. July, City No. 3.

Remedy:—Kerosene emulsion, Cities No. 1, 5, 9. Wash off by force, Cities No. 3, 5. Lime sulphur, Cities No. 4, 9. Winter culture, Lady Beetle, City No. 6. Scalecide, City No. 11.

Time of treatment:—Spring, City No. 4. Summer, City No. 9. Fall, City No. 1. Winter, City No. 3.

BAGWORM (*Thyridopterix cyhemeraeformis*).

Small moths; female wingless

Best recognized in caterpillar state; covered with tapering bags, made of bits of leaves, etc., of food plant, held together with silk.

Winters in eggs contained in bags or cases formerly used by females.

Male moths fly in September and October.

BAG WORM—Reported from:—1. St. Louis, Mo. 2. Columbus, Mo. 3. Cincinnati, O. 4. Topeka, Kansas.

Condition:—Serious, Cities No. 1, 3, 4.

Food Plants:—All but *Ailanthus*, City No. 1. Evergreens, fruit and all ornamental trees, Cities No. 3, 4. Sycamore, linden, poplar, locusts, gums, conifers, and sometimes deciduous trees, City No. 4.

Active:—June to July, City No. 1. August, City No. 2. May to August, City No. 3. May, June, July, City No. 4.

Remedy:—Spray with arsenate of lead, Cities No. 1, 2, 3, 4. Collect cocoons and burn in winter, Cities No. 1, 3, 4.

Time of treatment:—June, City No. 1. Winter, City No. 4. Entire summer, Cities No. 2, 3, 4.

FALL WEB-WORM (*Hyphantria textor*).

Small moths, white or yellowish. Sometimes marked with black spot on upper wing.

Caterpillars having yellowish, brown and black markings. Winter in cocoon.

Moths emerge early in spring.

Caterpillars make nests over ends of branches under which they feed.

FALL WEB-WORM—Reported from:—1. Youngstown, O. 2. Fort Worth, Tex. 3. Pittsburgh, Pa. 4. St. Louis, Mo. 5. Lowell, Mass. 6. Columbia, Mo. 7. Springfield, Ill. 8. New Haven, Conn.

Condition:—Serious: Cities No. 1, 7.

Food:—All deciduous trees. Hackberry, City No. 2.
Elm, City No. 7. Nearly all shade trees, City No. 7.

Active:—May, June, August, City No. 1. Summer, City No. 2. Late summer, early fall, City No. 7.

Remedy:—Arsenate of lead and burning, Cities No. 1, 2, 7. Removing branches, City No. 7.

Time of treatment:—Spring, mid summer, late summer, early fall, City No. 7.

SAN JOSÉ SCALE (*Aspidirtes perniciosus*).

Small circular scales, light to dark gray.

Winter as partly grown adult.

Young born alive and able to move about.

Males—Winged.

SAN JOSÉ SCALE—Reported from:—1. Cincinnati, O. 2. Worcester, Mass. 3. Fitchburg, Mass. 4. Rochester, N. Y. 5. Lowell, Mass. 6. Manchester, N. H. 7. Providence, R. I. 8. Albany, N. Y. 9. Cincinnati, O. 10. Toledo, O. 11. Hartford, Conn. 12. Springfield, Ill. 13. Reading, Pa. 14. Newburg, N. Y. 15. Grand Rapids, Mich. 16. New Britain, Conn.

Condition:—Serious: Cities No. 1, 7, 8, 9, 10.

Food:—Cherry, pear, soft maples, Euro. chestnut, roses, etc., Cities No. 1, 9. Lilac, linden, Cities No. 4. Scotch elms, apple, Japanese quince, all deciduous trees.

Active:—Summer months in general.

Remedy:—Pruning and spraying lime sulphur, Cities No. 9, 8, 15. Scalecide, Cities No. 7, 14. Painting heavy branches kerosene emulsion, City No. 15.

Time of treatment:—May and June, City No. 9. Early Spring. Spring to fall in general.

APHIDS (*Aphididæ*).

A family of soft bodied insects of many members, infesting a great variety of plants, living on plant juices.

Extremely prolific, and has many broods per season.

APHIDS—Reported from:—1. Niagara, Canada. 2. Cleveland, O. 3. Fitchburg, Mass. 4. Utica, N. Y. 5. Chicago, Ill. 6. Seattle, Wash. 7. Milwaukee, Wis. 8. Tacoma, Wash. 9. Reading, Pa. 10. Portland, Ore. 11. New Britain, Conn. 12. Saskatoon, Canada.

Condition:—Serious: Cities No. 6, 8.

Food Plants:—White Birch, City No. 1. Maples, Cities No. 2, 4. 12. Elms, Cities No. 2, 4. Willows, linden. catalpa, ash, cherry, poplar, shrubbery, generally.

Active:—1. July and August, Cities No. 1, 4. April 15th, to October 1st, City No. 2. June, City No. 8. Early spring to fall in general.

Remedy:—Kerosene emulsion, Cities No. 1, 6. Lime sulphur solution, City No. 8. Tobacco mixture, City No. 8.

Time of treatment:—March, Cities No. 1, 4. Summer in general.

ELM BORER (*Saperda tridentata*).

Gray beetle $\frac{1}{2}$ inch long; margined and crossmarked in red.

Grub—Flattened, tapering, legless, working under bark.

Eggs laid on bark in June or later.

Life cycle one or two years.

ELM TREE BORER—Reported from:—1. Fort Worth, Tex. 2. Pueblo, Col. 3. Columbia, Mo.

Condition:—Serious: Cities 1, 2.

Food:—American elms, Cities No. 1, 2, 3. Mountain ash, box elder, City No. 3. Occasionally other varieties.

Active:—Dry summers.

Remedy:—Pick out larvæ from trees, remove and burn all infested branches.

Time of treatment:—Early spring and throughout summer.

TENT CATERPILLAR (*Malacosama americana*).

Dull reddish moths, two pale stripes on upper wing.

Winters in egg state, young caterpillars emerging early in spring, making conspicuous ugly nests usually about a fork, where the worms shelter at night and during rains.

TENT CATERPILLAR—Reported from:—1. Vancouver, B. C. 2. Pittsburgh, Pa. 3. Fitchburg, Mass. 4. Utica, N. Y. 5. Chicago, Ill. 6. Lowell, Mass. 7. Seattle, Wash. 8. Lawrence, Mass. 9. Winnipeg, Can. 10. Tacoma, Wash.

Condition:—Serious: City No. 7. Not serious: Cities No. 1, 2, 10.

Food:—Alder, wild cherry, City No. 7, 10. Fruit trees in general.

Active:—June to August, City No. 1. Spring and summer months in general.

Remedy:—1. Cut out and burn, City No. 1. Cutting tents, spray with fish-oil soap before first moult, gather egg masses during winter, City No. 10.

Spring, summer and winter treatments.

MAPLE LEAF SCALE, MAPLE PHENACOCCLUS (*Phenacoccus acericola*).

This scale infests the underside of leaves, and the branches and trunk of hard maples.

Winters on the trunk as young, crawling onto the leaves in the spring.

Eggs are laid in a waxy secretion.

Two broods a year.

MAPLE LEAF SCALE (*Phenococcus*)—Reported from:—1. Seattle, Wash. 2. Toledo, O. 3. Reading, Pa.

Condition:—Serious: City No. 1. Not serious: City No. 3.

Food:—Maples, City No. 1. Sugar and Norway Maples, City No. 3.

Active:—Summer, City No. 1. May and June, September and October, City No. 3.

Remedy:—Lime sulphur, Cities No. 1, 3. Whale oil soap, City No. 3. Soluble oils, City No. 3. Scrubbing with stiff brush, City No. 3.

Time of treatment:—Fall and winter, City No. 1. Summer and fall, City No. 3.

BLACK-BANDED SCALE, (*Eulicanium nigrofasciatum*).

Small semi-globular, red, black banded scales.

Winters in adult state.

BLACK BANDED SCALE—Reported from:—1. St. Louis, Mo. 2. Albany, N. Y.

Condition:—Serious: Cities No. 1, 2.

Food Plants:—Sycamores, eastern and western, City No. 1. Maples, City No. 2.

Active:—August and September, City No. 1.

Remedy:—Scalecide near buildings, lime sulphur better, City No. 1.

Time of treatment:—November, City No. 1.

POPLAR BORER (*Saperda calcavata*).

Large beetle, grayish with yellow patches.

On trunks of poplars and willows in August and September.

Full grown larvæ about two inches long.

Life cycle probably three years.

POPLAR BORER—Reported from:—1. Chicago, Ill. 2. Springfield, Ill.

Condition:—Serious: City No. 2.

Food:—All poplars, willows, City No. 2.

Active:—August, City No. 2.

Remedy:—Dig out larvæ, carbon bisulphide, tobacco decoction at base of tree.

Time of treatment:—Summer.

SPINY ELM CATERPILLAR (*Evanessa antiopa*).

Beautiful, large, maroon butterfly, with blue spots and yellowish margins on wings.

Caterpillar about two inches long when mature. Dark brown, with row of red spots on back, and many branched spines.

Winters as an adult.

SPINY ELM CATERPILLAR—Reported from:—1. Worcester, Mass. 2. New Britain, Conn.

Condition:—Serious: City No. 2.

Food:—Elms, poplars, willows, City No. 2.

Active:—May and June, City No. 2.

Remedy:—Arsenate of lead and picking out insects. City No. 2.

Time of treatment:—May and June, City No. 2.

MAPLE BORER (*Plagionotus speciosus*).

Beautiful black and yellow beetle nearly 1 inch long. June to August.

Eggs laid into bark July and August.

Larvæ enter sap wood and live in trunk for 16-18 months. Completes life cycle in second year.

MAPLE BORER—Reported from:—1. New Haven, Conn. 2. Grand Rapids, Mich.

Condition:—Serious: City No. 2.

Food:—Sugar Maple, Cities No. 1, 2.

Active:—Summer, City No. 1. Entire year, City No. 2.

Remedy:—Carbon bisulphide and dig out, City No. 1. Collect adults, City No. 1. Cut down and burn badly infested trees, City No. 2.

Time of treatment:—May and September, City No. 1. Late summer and early fall, City No. 2.

SYRINGA BORER (*Podosesis syringæ*).

Moths—Dark reddish brown, hind wings yellowish, transparent.

Grubs or borers live in sap and heart wood.

SYRINGA BORER—Reported from:—1. Denver, Col. 2. Pueblo, Col. 3. Springfield, Ill. 4. Portland, Oregon.

Condition:—Serious: Cities No. 2, 3, 4.

Food:—White ash, Cities No. 1, 2. Mountain ash, City No. 3.

Active:—May and June, City No. 3.

Remedy:—Carbon bisulphite, City No. 1. Cut away dead branches, City No. 3.

Time of treatment:—June to October, City No. 1. Winter, City No. 3.

OAK CLYTUS—Reported from:—Minneapolis, Minn.

Condition:—Very serious: 8,000 trees removed 1911 to 1912.

Food:—Black and red oaks, American elms, maples.

Active:—June to September.

Remedy:—Spraying trunks with mixture of lamp black and lime. Burning infested trees only real measure to check pests.

Time of treatment:—Summer and winter.

SMALL ERMINE MOTH (*Hyponometa padellus*)—Reported from:—Saskatoon, Canada.

Condition:—Serious.

Food:—All deciduous trees.

Active:—June to September.

Remedy:—Cut and burn branches, spray with paris green.

Time of treatment:—Middle of June.

FIR SAW FLY (*Sophyons abietis*)—Reported from:—Winnipeg, Can.

Condition:—Serious.

Food:—White and black spruce.

Active:—End of June.

Remedy:—Arsenate of lead.

Time of treatment:—End of June.

WALNUT BARK BORER—Reported from:—Terre Haute, Ind.

Condition:—Serious.

Food:—Oak and walnuts.

Active:—June and September.

Remedy:—Cut out and burn.

Time of treatment

WESTERN BLISTER BEETLE—Reported from:—Winnipeg, Can.

Condition:—Not serious.

Food:—Carragana, shrubs, and delphinium.

Active:—July.

Remedy:—Arsenate of Lead.

Time of treatment

ELM LEAF LOUSE—Reported from:—Minneapolis, Minn.

Condition:—Serious.

Food:—American Elm.

Active:—June to August.

Remedy:—Kerosene emulsion, whale oil soap, tobacco decoction.

Time of treatment:—June, or before leaves curl.

WHITE FLY—Reported from:—Portland, Me.

Condition:—Serious.

Food:—Shrubbery.

Active:—June to September.

Remedy:—Fumigation.

Time of treatment:—June to September.

WOOLY ELM LEAF APHID (*Schitzoneura americana*).

ELM CLUSTER LOUSE—Reported from:—Colorado Springs, Col.

Injury:—Not serious.

Food:—Elm and ash.

Active:—June to August.

Remedy:—Kerosene Emulsion.

Time of treatment:—Winter.

CHERRY TREE SLUG—Reported from:—Colorado Springs, Col.

Injury:—General.

Food:—Cherry and pear trees.

Active:—June, July, August; sometimes September.

Remedy:—Arsenate of lead, and white hellebore.

Time of treatment:—Summer and early fall.

LOCUST BORER—Reported from:—1. Denver, Col. 2. Cleveland, O. 3. Springfield, Ill.

Condition:—Serious: City No. 1.

Food:—Locust, City No. 1.

Active:—May and October, City No. 1.

Remedy:—Carb. bisulphide in summer, spray in winter, City No. 1.

Time of treatment:—Summer and winter, City No. 1.

WALNUT CATERPILLAR (*datana integerrima*)—Reported from:—Springfield, Ill.

Condition:—Not serious.

Food:—Walnut, hickory, etc.

Active:—July and August.

Remedy:—Remove infected branches or spray arsenate of lead.

Time of treatment:—When discovered.

SPRING CANKER WORM—Reported from:—Winnipeg, Canada. Westchester Co., N. Y.

Condition:—Serious.

Food:—Elm, ash, basswood, etc., no poplars.

Active:—May and June.

Remedy:—Arsenate of lead.

Time of treatment:—May and June.

OTHER INSECTS REPORTED.

TULIP TREE SCALE—Reported from:—Grand Rapids, Mich.

Treatment:—Lime sulphur solution.

CANKER WORM (*Anisopteryx pometaria*)—Reported from:—New Britain, Conn.

PIGEON TREMEX (*Tremex columba*)—Reported from:—Minneapolis, Minn.

PUTNAM SCALE (*Aspedrobes Ancyens*)—Reported from:—1. Cincinnati, O. 2. Toledo, O.

APPLE SCALE—Reported from:—1. Pittsburgh, Pa.

AILANTHUS WORM—Reported from:—1. Chicago, Ill.

MEALY BUG—Reported from:—Chicago, Ill.

GRAPA INTERROGATIONIS (Similar to Gypsy Moth)—Reported from:—Chicago, Ill.

SOME LITERATURE ON INSECTS INJURIOUS TO TREES.

FELT, E. P. Insects effecting park and woodland trees. 2 vols. N. Y. State Education Dept. 1907. \$4.50. Complete compendium, giving simple descriptions of injurious insects, and practical methods of combatting them. Illustrated by colored plates.

CORNELL UNIVERSITY AGRICULTURAL EXPERIMENT STATION. Insect pests and plant diseases. Bulletin 252. 1908. Free. Reliable and practical pamphlet.

SMITH, J. B. Our insect friends and enemies. Lippincott, 1909. \$1.50. Chapters on "the relation of insects to man, to other animals, to one another, and to plants; and the war against insects."

SANDERSON, E. D. Insect pests of farm, garden and orchard. Wiley, 1912. \$3.00. Revision of earlier books on this subject, giving recent methods of treatment.

SMITH, J. B. Economic entomology. Lippincott, 1896. \$2.00. Valuable textbook for use of agricultural schools and colleges, and for farmer and fruit grower.

LEVISON, J. J. Studies of Trees. John Wiley and Sons, 1914. Section on insects affecting ornamental and shade trees and methods of eradicating them.

NOTE.—Excellent information on this subject may also be obtained from Bulletins of the U. S. Department of Agriculture, State Entomologists and the State Experiment Stations.

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BULLETIN No. 12

CONCESSIONS AND PRIVILEGES
IN PUBLIC PARKS

A SUMMARY OF METHODS OF OPERATION
IN VARIOUS AMERICAN CITIES WITH COM-
MENTS BY MEMBERS.



American Association
OF
Park Superintendents

1915

Compiled by
ROLAND W. COTTERILL
Secretary
Seattle, Washington



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Seattle

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Concessions

CONCESSIONS IN PUBLIC PARKS

J. F. Foster, Superintendent of South Parks, Chicago, Ill.

The work suggests Coney Island. Coney Island suggests unrest, avarice, excitement, fraud. Most undesirable things even by suggestion in connection with public parks. Why, then, allow such suggestion? Why any concessions? Is the management of our parks incapable of operating a soda fountain? Is the public service so poor that it can not keep clean table cloths on refectory tables? Can park authorities employ no men who are capable of properly handling boats, ponies, skating houses, toboggan slides, and what not? Why concessions? Is it because it would add labor and responsibility to the already bowed shoulders of the over-burdened and unappreciated members of the organization? No! It is simply because—well, because.

Sometimes we must resort to feminine methods of settling questions; their conclusiveness and brevity have so much to recommend them.

But our fathers did their public business through concessions.

Shall we continue to be guided by the tradition of our ancestors and, like the Chinese, decline to learn anything, or, like the Japanese, be quick to correct ancient error?

The utilities of services usually handled by concessionaires in public parks are like the roads, walks, buildings and other structures; most undesirable intrusions in the eye of the lover of nature, with added offensiveness to the olfactories.

But people must be fed when hungry; given to drink when thirsty; to ride when weary. So refectories, soda fountains, boats, ponies and perhaps other things must be provided.

But these things are only incidents in a visit to the parks, and being such, the same care should be taken to make as little of them and render them as inconspicuous as is given by the designer of a park to make his roads, walks and buildings as few in number and as un-

obtrusive as is consistent with a reasonable compliance with the demands.

The appetites of the visitors to the parks should not be whetted by being constantly appealed to by the peanut and popcorn stands at every crossing of walks where crowds of people pass. Yet, that is what the concessionaire does. Why? There's money in it.

He creates as far as he can the appetite which so far as possible should be suppressed, and with his stand he defaces the beautiful landscape, which should be, and is, the greatest attraction to be found in the parks, the appreciation of which it should be the highest aim of park authorities to cultivate in the people.

Why is he allowed to do it?

Because to make it pay he must have these little hideous, unsanitary, untidy stands at the points of vantage, and believing that because children buy large quantities of nuts, cream in cone, popcorn, and what not, at some place where such a stand is erected, there must be a demand for it. (A great error.) The park authorities authorize the location of many, many stands entirely unnecessary and most undesirable.

It must pay, you know.

So in all utilities let to concessionaires, the demand is excited, and because of want of sufficient profit, the service is most generally inefficient and unsatisfactory and the parks become to a degree business centers and traffic is in evidence at every turn. The last thing to be desired.

Do not all park ordinances and regulations prohibit traffic, and therefore should we not assume that all consider it undesirable? That being so, should it not be reduced to the very minimum consistent with the necessity? Let the cost be what it may.

The South Park Commissioners of Chicago, during the forty-five years of their existence, have consistently held to the belief that the people can, through their own agents, the commissioners, supply themselves with accommodations requisite for the best enjoyment of a visit to the park, much better, more efficiently, and with less departure from the ideal park conditions than could possibly be the case with these utilities in the hands of concessionaires, and have during these forty-five years granted only one concession for one reason.

Beginning in 1875, with a small refectory, the utilities operated by the commissioners have steadily increased to two large refectories, two soda fountains, eight lunch counters, four row-boat liveries, barges and launches. Not a very large number of business places, considering the fact that there are 1,950 acres under the control of the commissioners in eighteen separate parks which are improved and being used by the people, the extremes being 14½ miles apart.

The commissioners have established only such trading places as in their judgment were necessary to meet the reasonable demands of the people and in giving careful consideration to this question have avoided placing many undesirable stands, and have satisfactorily met the requirements of the people.

The unreliability of the patronage in any park business being so entirely dependent upon the weather, having generally no steady support under all conditions, makes it most difficult to stock up with supplies and help sufficient to properly meet possible demands, provided profit and loss are the governing factors. It rains in the morning; the concessionaires think there will be no one in the park. At 2:30 it clears, is beautiful; thousands clamoring for refreshments; few waiters; "just out" of most things on the bill of fare; public growl. The superintendent calls up concessionaire. What does he mean by such service? He can't order waiters and stock up on a rainy morning and lose all he has made in a week; he can't make the weather. Result: park officials accused of being interested in concession, everybody unhappy.

The prices charged are the very lowest. Particularly is this so at the lunch counters in the play parks where the people are not overly blessed with the world's goods. At the other places, the prices are about 20 per cent lower than charged for equally good service in private restaurants in the city.

The very best men obtainable are placed in charge of the different places, with one general manager in charge of all, who does the buying and makes requisitions for all furnishings and supplies needed.

The receipts are recorded in cash registers and when the business is large cashiers are employed at the registers. An auditor visits each place every day, checks up receipts and brings the money to the general office.

The commissioners require the very best service, absolute cleanliness, the best of everything served and ample water service. In order that the best ice cream may be served at the lowest price, the commissioners installed and operate an ice cream factory from which all the lunch counters and refectories are supplied. Nothing is spared to make the very best cream.

As to rowboats and launch service: In the first place, excellent boats are used. The best obtainable launches are in service and sufficient men are employed to give prompt and efficient service. The men are all in attractive uniforms. Cleanliness in everything is required, and all employes about the boats and landings must be good swimmers capable of assisting any who may fall into the water. No expense is spared to keep the boats and launches in the best possible condition.

In the winter the skating houses, the renting and grinding of skates, refreshment counters and the renting of toboggan sleds are handled by the commissioners at a minimum cost to the public. No intoxicants are on sale in the parks.

The lunch counters in the recreation buildings are open the year round every day from 1 p. m. to 10 p. m. That at the golf shelter from April 15 to November 15, from 5:30 a. m. to dark. The refectories and soda fountains from June 1 to September 20th, usually.

The receipts from the small lunch counters range from \$2 to \$70 each per day. The larger refectories, including the soda fountains, \$25 to \$575 per day.

Some years the aggregate charges against all trading accounts, as they are called upon the books of the commissioners, somewhat exceed the aggregate receipts. Other years the accounts are about even. The investment in equipment for the various facilities operated by the commissioners ranges from \$325 for one of the small lunch counters to \$5,500 for the largest refectory, the aggregate being, including boats, barges and launches, \$55,455.

The serving of refreshments, furnishing boats, skates and toboggan sleds should be considered as much a part of the duty of the park authorities as the supplying of beautiful, well-mowed, shady lawns, benches, sanitary accommodations and other pleasures and conveniences the public expect to find at their disposal in parks, and should be fur-

nished in the best possible manner at the very lowest cost to the people and be always available, no matter what the weather may be, for they are necessities if a visit to the parks is to be completely enjoyed. But if these things in parks are to be considered entirely as business propositions, and run on the principle that they must be made to pay, the result must either be prices so high as to be prohibitive to most people or most of the time poor and inadequate service. Operated by park authorities with the object of meeting the people's wants, meeting the profit or loss as it may come, will always give satisfaction to the general public who have intrusted the management of these things to the park officials, that is, provided satisfactory service is given.

The people seldom criticize large expenditures if satisfactory results are obtained; but small expenditures and rigid economy with poor and inadequate results will always bring forth the query, "What in the world do they do with all their money?"

Park authorities should not undertake to do anything for the people's pleasure which they have not the money to do well, particularly in the way of service. A park is not a commercial enterprise; is not a banking business. The best is none too good for the poorest and worst people.

The desire to show a great income, such as induces the trustees of one of the oldest and richest churches in the country to rent to the unfortunate poor almost uninhabitable, disease-inducing apartments, is about as great a sin as I can think of. It is the same spirit which would demand a profit in park business, and while, fortunately, it can not in this particular work do so great an evil, it can, and I am afraid, in places, does, place personal credit for a good financial showing above the welfare and pleasure of the people.

Questionnaire

DATA REGARDING OPERATION OF PARK CONCESSIONS OR PRIVILEGES, REFRESHMENT STANDS, LUNCH COUNTERS, BOAT LIVERIES, ETC.

Boat Liveries, Etc.

1. Are your concessions operated by the department or by private parties?
2. Are you satisfied with the method, or do you contemplate changing?
3. What concessions do you operate or award?

If Operated by Department

4. What was your gross revenue for year 1914?
5. What was your operating cost for year 1914?
6. What loss or profit for year 1914?
7. Do you employ a special manager for this feature or is it handled by regular department executives?
8. Do you operate refectories only in large parks where profitable or do you operate also at parks where there is a loss?

If Awarded to Private Parties

9. Do you award concessions to high bidders or by selection based on standing and ability of applicants?
10. Which do you regard as the best method of fixing fees: lump sum per month or annum or percentage of receipts?
11. Enumerate fees charged for various concessions in your parks.
12. Do you award concessions for a term of years, or annually?
13. Do you regard it as advisable to change concessionaires if giving satisfactory service, should a higher fee be offered by new parties?
14. Do you reserve the right to regulate charges?

General

15. What do you think of a plan of the department operating concessions in large, heavily patronized parks and awarding concessions in outlying neighborhood parks to parties who live nearby and can afford to operate on Sundays and holidays or such times as conditions are favorable?
 16. Does your city permit, or do you believe it advisable to permit, amusement privileges in parks, such as merry-go-rounds, photo galleries, shooting galleries, side shows, etc.
 17. Does your city permit, or do you believe it advisable to permit, slot machine devices, such as weighing machines, gum or candy vending machines, etc.? If so, what is your basis of fees, lump sum or percentage of revenues?
-

NOTE—This questionnaire was submitted to park executives in thirty-five cities having a population in excess of 100,000. All did not respond, but the following data is a digest of the replies received.

JOHN C. OLMSTED.

In my opinion, it would be decidedly preferable in most cases that park commissions should conduct the various privileges in parks, under the direct control of the general superintendent. The usual result would be that the people would receive better service at the same or less prices as would be charged by a concessionaire.

Moreover, from the viewpoint of a park designer, the results attained by a park commission running its own privileges are much to be preferred, because a concessionaire is tempted to skimp on neatness and cleanliness, length of hours, length of season, variety, quality and quantity of goods and especially they have a tendency to display conspicuous and objectionable advertising signs and placards and to sell goods in such a way that papers and other containers are spread about as objectionable litter in the park.

In fact, to my mind, the only advantage worth mentioning in favor of letting privileges to someone who intends to make money out of them is that when the park finances are in a low condition it may be a business necessity, or at least it may bring in an income which would be used to such advantage for other park purposes as to counterbalance the disadvantages that are almost certain to result from a concession system.

In case it is deemed necessary to rent privileges, I think that much more care should be taken in specifying the quality, variety and quantity

of goods, the good appearance of attendants, hours of operation, length of season, cleanliness of premises, avoidance of spreading papers and other containers, avoidance of large vulgar display cards and other methods resorted to in retail stores, which are not suitable in public parks, than is usually done.

I think that as a rule it would be much better to let all privileges, in all the parks, to one person or one concern, so as to make it enough of an object to interest a better class of concessionaire with more capital and one who might be willing to carry a loss in some places for the public accommodation, as an offset against large profit in other places. I should certainly not advise letting such privilege to the highest bidder, unless the bidder was found to be entirely competent and financially responsible.

MINNEAPOLIS, MINNESOTA.

Theodore Wirth, Superintendent of Parks.

I have always been of the opinion that any service to be rendered the public in its public parks should be rendered by the administration of those properties, namely the park commissioners and their employes. My principal reasons for this contention are:

First. Public property should not be permitted to be used for private gain of any kind.

Second. The responsibility for proper service on all public properties rests with the authorities in charge of them and that responsibility can be best discharged by rendering the service through their own employes, over whom they have control. As to the business policy which should be employed in rendering refectory service, I am of the opinion that the goods offered for sale should be of the best quality, served in the most sanitary and attractive manner.

A fair profit must be made on the goods sold if for no other reason than not to create unfair business competition. The buyer of these goods is not entitled to receive them at cost at a park refectory any more than at a private establishment. The profits from such establishments are legitimate earnings which can be used for improvement or maintenance purposes of the park properties of which they are a part.

It may not always be feasible to render all the service the public desires and in some instances the smaller privileges may well be leased to responsible parties. In such cases the authorities must control the prices and must see to it that the concessionaire lives up to his contract.

Replying to questionnaire, the Minneapolis situation is as follows :

We operate refectories and refreshment stands, launch, sail boat and rowboat liveries and rent bathing suits, skates, toboggans, etc. The only concession awarded private parties is our pony track, because we have no facilities for wintering the ponies, but we will probably eventually operate the pony track.

Our 1914 record on boat liveries shows gross revenue of \$13,941.60 with maintenance and operation expense of \$8,962.41, or a net revenue of \$4,979.19.

The gross revenues of our refectories and refreshment stands were \$68,482.06 with expense for merchandise, equipment, labor, etc., also depreciation aggregating \$53,872.44, or a net revenue of \$14,609.62. We employ a refectory manager at a salary of \$2,100 per year.

We do not operate refreshment stands in small parks nor anywhere where they would not be self sustaining. We feel that where there are not enough sales to meet the expense, there is not enough need for the service.

Standing, reliability and character of concessionaires should be given more consideration than value of bid.

Percentage basis of fee payment is best if accurate account can be kept, otherwise annual fee.

Our pony, photo and auto livery concessions at Minnehaha Park are let for one year term at following fees. Pony track, \$400; photo, \$100; auto livery, \$150.

Concessionaires should not be changed merely to secure a higher fee. Park authorities should learn what a concession with good service is worth and fix the fee accordingly. A satisfactory concessionaire should be preferred at a reasonable price to a higher bidding competitor of unknown ability or unsatisfactory reputation.

If Sunday service only in remote small parks is desirable the department should handle it. Let a park employe residing near the place attend to it, the department erecting and operating a stand.

Do not believe in amusement privileges in parks. Good free music, playgrounds and general recreation features, but no commercialized amusements.

We operate weighing machines which we own, but do not permit any other form of slot or vending machine.

WINNIPEG, CANADA.

George Champion, Superintendent of Parks.

We operate all concessions, are perfectly satisfied with the method and do not contemplate a change.

Our 1914 gross revenue was \$17,501.60, operation cost \$14,267.24, or a net revenue of \$3,234.36, all from one concession in our largest park. Operation handled by regular park employes.

Do not agree with proposition of awarding concessions for Sunday or holiday service in remote small parks. If the large refectories are operated by the Board, the same machinery will take care of the smaller ones. If it is impossible for the Board to operate at a profit, how can a concessionaire be expected to make a profit and give good food and service at reasonable prices? If the small refectories are essential, any loss sustained by them should be offset by the profit made at the larger refectories. Profits should not be the sole end in view in operating park refectories, but rather good service at a reasonable cost to the people.

We do not permit, nor think it advisable to permit, the operation of any so-called amusement shows in any public park. We take the ground that if it is necessary to employ these agencies to attract people to the parks, then the parks are a failure and the expense of their upkeep is unwarranted. Also that the function of the parks is to encourage sane, healthy enjoyment in the open air, in contact with nature's best influences of light and beauty and away from the exciting and artificial enjoyment engendered by the amusement show.

We do not permit, nor think it advisable to permit, slot machines as they are not necessities and are simply machines for obtaining money from people who can usually ill afford to spend it, therefore they are entirely out of place in a public park.

SPOKANE, WASHINGTON.

J. W. Duncan, Superintendent of Parks.

Our concessions are operated by the department and we are entirely satisfied with this method and do not contemplate a change. The work is handled by our regular employes. Our gross revenue for 1914 was \$3,032.25; operating cost, \$2,380.98; net revenue, \$642.27.

Do not approve of plan of awarding concessions in outlying small parks. The public will get better service and be better satisfied if the department handles its own concessions, even if some of them be run

without profit. I do not believe they should be operated at a loss. We only operate small refreshment stands and aim to sell the best goods obtainable, at the least margin of cost. In this way the public gets good returns and should there be complaint (which in five years' operation by us there has been none) the department can much more easily regulate it than if run by a concessionaire.

We do not permit any amusement privileges, nor do we approve of them in public parks unless operated by the department as part of the playground paraphernalia and without charge.

We do not permit, nor do we consider it advisable to permit, slot devices or vending machines in parks, for they often get out of order and are considered by the public as bunco propositions, thereby causing more or less criticism.

INDIANAPOLIS, INDIANA.

James H. Lowry, Executive Officer.

Our concessions are awarded to private parties and we are satisfied with this method. The privileges we award are refreshment stands, canoe livery and one golf course is leased to a private club.

Our concessions are advertised, competitive bids received and awards made for terms of from one to three years.

In making awards not only the fee offered but the standing of the applicant is considered, but we are required to call for competitive bids.

I think well of the plan of awarding concessions in small outlying parks to nearby residents to operate on Sundays.

We do not permit, nor think it advisable to permit, in public parks, amusement privileges, vending machines, etc.

Fees received from refreshment concessions vary from \$250 to \$1,000 per year; \$1,800 for canoe livery and \$1,000 for golf course.

CLEVELAND, OHIO.

Fred C. Alber, Commissioner of Parks and Public Grounds.

The Park Department operates the refreshment stands, lunch counter and boat liveryes.

Prior to 1914 the Park Department received bids and sublet the refreshment privileges, but in 1914 this department operated all the

refreshment stands throughout the system, and we would not change now from the present system.

We operate refreshment stands, boat liveries, dancing pavilions and bathing beaches.

Our gross revenue on refreshment stands for 1914 was \$81,754.81.

Our operating cost, including depreciation and loss on equipment, was \$63,085.52. Profit, \$18,669.32.

We employ a superintendent of refreshments and at each of our parks where we operate one or more stands we have a manager and we hold him responsible for the stands in that particular park.

We operate refectories at both the large and the small parks. In the small parks we operated without a loss.

We formerly awarded concessions to the highest bidder, but fixed the price at which they would sell their supplies.

I regard the best method of having the department operate the stands, as the purchasing department purchases the supplies and the city chemist inspects the supplies which are purchased.

For the year 1914 we received bids to the amount of \$9,000 for our concessions, but you can see by the Department's operation we received a profit of \$18,000 and gave better satisfaction to the public.

We formerly awarded concessions for a term of two years.

I do not think it advisable to change concessionaires if they give satisfactory service, but, of course, it is very difficult to have the public understand that you are not playing any favorites, if you should receive an offer of a higher fee and not give the new parties an opportunity to show their ability of operating a stand.

We did reserve the right to regulate the prices charged.

I think if the Department operates stands they should organize and assume all responsibility at both the heavily patronized parks and in the outlying neighborhood parks which are not as profitable.

We do not believe it advisable to permit amusement privileges in the parks, as merry-go-rounds, photo galleries, shooting galleries or side shows.

We do not permit any slot device of any nature, either weighing machine, gum or candy vending machines in the parks. The only concessions which we permit are telephone pay stations and individual drinking cups at the park springs.

By the Park Department operating park concessions we are sure that the public can get the best of food stuff, and you can also secure

sufficient help on Saturdays, Sundays and holidays, and by paying good wages for that kind of service and installing the ticket system so that you get all the money—and it is an easier check—I think you will have better results than by leasing to concessionaires.

I herewith give you the amount paid for help:

Superintendent	\$1200	per year
Bookkeeper	900	per year
Managers at the large parks.....	90	per mo.
At the smaller parks.....	\$65 to 75	per mo.
And 25 cents an hour for clerks.		

OTTAWA, CANADA.

Alexander Stuart, Superintendent.

We award our concessions to private parties, are satisfied with the method and do not contemplate a change.

We have renewed from year to year with the same parties at an agreed fee on annual basis. We do not believe it advisable to change concessionaires provided service is satisfactory and a reasonable fee is paid.

We do not permit and do not approve of commercialized amusements in public parks or slot machines or vending devices.

OMAHA, NEBRASKA.

J. B. Hummel, Commissioner of Parks.

Our concessions are awarded to private parties, we are satisfied with the method and do not contemplate a change.

We have refreshment and boating privileges which are awarded annually for a lump sum fee per annu into the highest bidders, if satisfactory.

We do not permit or approve of amusement privileges in parks or slot machines for vending merchandise, etc.

NEW YORK ZOOLOGICAL PARK.

Herman W. Merkel.

The New York Zoological Society are custodians under a state

charter of the New York Zoological Park and of the New York Aquarium in Battery Park.

Privileges are operated in both places by the Zoological Society itself. The privileges in the Zoological Park consist of two restaurants, six soda pavilions, riding animals, boating and the sale of publications such as post cards, guide books, etc. These are operated at a profit. The proceeds of the privileges can, under the charter, be expended only for the purchase of exhibits, and the gate receipts from the two pay days a week can be expended on maintenance of buildings and grounds.

I think that whenever a city's charter permits, such privileges should be operated by the park department, and I believe that in each park of any size refreshment stands should be operated so that they will return a very small profit only. Larger concessions should be leased out to the highest bidder for a term of years under a very rigid agreement regarding prices and quality of food, etc., furnished. Merry-go-rounds, shooting galleries and so-called side shows, as well as peddlers and fakirs of all kinds, are decidedly out of place in nearly all public parks. Should a city decide to operate such "attractions" they should be segregated in some "fair grounds" away from public parks.

CINCINNATI, OHIO.

Wm. Hodgkinson, Secretary.

It has so far been the policy of this Board to lease the concessions or privileges to private parties for a period of one year, for a stated sum per annum, rather than for a percentage of the receipts.

This, at present, covers the confectionary privileges in three parks, and the boating in two parks, all given to the highest bidder, but taking into consideration the standing and ability of the applicant; in other words, the lease is given to the highest and best bidder.

The lease specifies the prices to be charged and that all goods sold must be of the highest purity; it also regulates the conduct of the employes of the lessee, also that the buildings occupied by him must be kept in sanitary condition and in good repair.

This Board endeavors to keep the parks free from other private commercial ventures, therefore no slot machines, merry-go-rounds or even public speaking are allowed.

The Board has often discussed the advisability of operating its own concessions, in an endeavor to greater serve the public, to sell goods at minimum prices and to secure a greater use of the parks. It has been prevented from doing so, however, owing to the financial condition of the city and the small amount of money this Board receives for

the maintenance of parks and playgrounds and to the fact that all revenues derived within the department must be turned into the city general fund.

LOS ANGELES, CALIFORNIA.

S. B. Norton, Secretary.

Our concessions are operated by private parties under contract.

We are not entirely satisfied with this method, but our efforts to obtain control have not met with favor at the hands of the city council and for this reason we are unable to change the system.

The concessions operated under contract consist of refectories, carrousel and boathouses.

These concessions are awarded to the highest bidder.

All rentals are either by the year or by the month and not on a percentage basis, and we are inclined to favor the yearly or monthly rental.

Our concession rentals are as follows:

Carrousel	\$500.00 per year
Eastlake boathouse and refectory....	100.00 per mo.
Westlake boathouse and refectory....	82.00 per mo.
Hollenbeck boathouse and refectory	55.00 per mo.
Echo Park boathouse and refectory	35.00 per mo.

All boathouse and refectory concessions are for a period of three years. The carrousel concession is for a period of eleven years for the reason that the concessionaires were required to erect a building, which, with the plant, cost about \$20,000.

We would prefer to have one concessionaire in continuous possession of any given concession, but this is a matter over which we have no control as these concessions are let to the highest bidder.

Our standard refectory concessions specifications are very rigid and give the Park Department authority to regulate prices as well as the quality of food and refreshments served.

No amusement privileges are permitted in any of the parks in our system except a carrousel in one park. We would certainly not look with favor upon any others mentioned in your question.

It is contrary to our policy to permit concessionaires to use slot machines or vending machines and as far as we know there are none of these.

SAN FRANCISCO, CALIFORNIA.

John McLaren, Superintendent of Parks.

Our concessions are operated by both the Park Commission and private parties. We are satisfied with both methods.

The Park Commission operates the children's quarters and the beach chalet; private parties operate the boathouse on Stow Lake and the Japanese tea garden.

The gross receipts from concessions operated by the Park Commission for year 1913-14 were \$35,810.90; operating cost, \$33,263.88—the profit amounting to \$2,574.02.

Special managers are employed. The manager of the children's quarters is paid a monthly salary of \$150 and the manager of the beach chalet receives \$75 per month.

Refectories are only operated in the Golden Gate Park and the Great Highway being the children's quarters and beach chalet respectively.

The two concessions operated by private parties were allowed some years ago and are still under the control of the original parties.

We regard the method of fixing a lump sum per month as the best method.

We receive from the Japanese tea garden \$50 per month and from the boathouse \$25 per month.

Concessions are awarded for a term of years.

We have never changed concessionaires.

The Park Commission reserves the right to regulate charges.

The present Park Commission has adopted a policy of refusing all requests for concessions.

We have a few swings, merry-go-round and a donkey goat track at the children's quarters and throughout the parks of this city and Golden Gate Park we have tennic courts, bowling greens, golf links, baseball and football grounds, race trotting track, cricket fields and bicycle tracks. We have playgrounds in many of the outside parks but they are under the jurisdiction of the playground commission. We do not advise sideshows, shooting galleries, etc.

We sell tickets at the children's quarters for the merry-go-round and donkey and goat tracks at the rate of three for five cents. All other amusements are free.

- * Do not advise the use of vending machines.

KANSAS CITY, MISSOURI.

Ralph R. Benedict, Acting Executive Officer.

Our concessions for the last fiscal year and the coming year have been and are to be operated by private parties.

We have tried both methods of operation, first by private parties and then by the department, and last we have come back to operation by private parties. We have satisfied ourselves that this is the best method for our city.

We award refectory or refreshment stand privileges, which include small stands throughout the park, boat liveries and auto liveries in the park.

The gross revenue for the year 1913, the last year operated by the department, from the refreshment stand was \$14,610.68.

Operating cost for year 1913, was \$14,899.68. Loss, \$289.00.

We operated with a special manager for this feature.

We operate a refectory in only one park, this park being a large one and some distance from the center of the city.

Our concessions are awarded to the highest bidder.

We regard the best method of fixing fees that of a lump sum per annum, payable in installments.

Refectory fees for last year aggregated \$6,050.00. Boating and auto livery was 10 per cent of the gross receipts.

We award concessions annually.

We reserve the right to regulate all charges to the public and also the service.

We find that the department does not make a success of operating concessions in large, heavily patronized parks. In neighborhood parks we do not permit concessions of any sort, as the stores are in a very close proximity to such neighborhood parks.

We do not permit, or believe it advisable to permit, any amusement privileges in the parks, such as merry-go-rounds, photo galleries, etc. We do not believe that these have a place in a public park, as we believe that our parks are intended solely for people to get close to nature and that "catch penny" devices are solely for amusement gardens, white cities, etc.

We do not permit or believe it advisable to permit any slot machines for the same reason as given above.

CHICAGO, ILLINOIS.

J. H. Prost, Superintendent of Special Park Commission.

The Special Park Commission of the City of Chicago has never given any consideration to concessions in our eighty-six small parks and twenty-nine playgrounds. The city has another department which has charge of granting permission for concessions in the entire city, including the small parks supervised by this commission. You understand that there are about thirteen park commissions in Chicago and that the other twelve have supervision over all concessions.

I think park commissions should operate all concessions in both the large and small parks under its supervision, and these concessions should be managed and regulated with a view of educating the people rather than catering to their passions and tastes. Things injurious to health, sanitation, cleanliness and ugliness of sight should not be distributed and encouraged through concessions in any park. Only clean and wholesome food, refreshments and entertainments should be encouraged. I do not believe it advisable to permit amusement privileges in our public parks.

PHILADELPHIA, PENNSYLVANIA.

Fairmount Park Commission, T. S. Martin, Secretary.

The only concessions granted by this commission are two merry-go-rounds, which became the property of the city upon their completion, the party constructing the same having the right to operate for the term of twenty years.

Two restaurants, for which an annual rental of \$500 each is paid.

A public canoe house, operated by the Commissioners, for which a charge of \$250 per month is made for the care and storage of canoe and use of locker.

CHICAGO, ILLINOIS.

J. F. Foster, Superintendent South Parks.

The South Park Commissioners grant no concessions on park property.

The Commissioners have taken no action looking toward changing the method.

The South Park Commissioners operate three refectories in summer and two lunch counters at skating houses in winter. Rowboats are operated in five of the parks and launches and barges in three.

The gross revenue of the refectories from March 1st, 1914, to January 1st, 1915, was \$82,899.15.

The cost of operating the refectories in this time was \$86,308.52, the loss in this time being \$1,508.67.

We have a special manager of refectories and lunch counters. Two of the refectories make a profit, one makes a loss.

Personally, I do not approve of granting concessions of any kind within the parks. Any accommodation service is very unsatisfactory to the people as they never know what to depend upon and can only lead to disappointments and filing of complaints.

I do not believe it advisable to grant permits for amusements of the class mentioned, within public parks. However, there might be arguments in their favor, but they should be operated by the Park Commissioners.

I should not advise slot machines in public parks.

South Parks, under the control of the South Park Commissioners, have a very extensive frontage on Lake Michigan. Excursion steamers are permitted to receive and discharge passengers at various landings along this front under permits issued by the Park Commissioners. The rates of fare to different points to which steamers may run must be approved by the Park Commissioners and certain regulations conformed to as to character of boats, character of employes and prohibition of use of liquors on boats and any other things that will lead to unsatisfactory or immoral conditions. However, these boats are not permitted to go within the waters of the park.

DENVER, COLORADO.

Fred C. Steinhauer, Superintendent of Parks.

Until last year all refreshment and boating privileges in the various large parks of Denver were let out to the highest responsible bidder for a term of years at a yearly rental—the rental of the various parks going to different parties.

I believe the yearly rental the most satisfactory basis of payment.

I also think that the concession should be for a term of years rather than annually, providing, always, that it is under the complete control of the Department with power of removal if unsatisfactory, as has

happened in this city. By renting for a term of years, the concessionaire, if he is progressive, is continually learning the wants of the park patrons and accordingly rendering better service.

I believe if you have an A-1 man in charge, a higher price from another party should not be an inducement to change the concessionaire, but the constitution or charter under which a park is working may govern this point.

We very properly reserve the right to regulate charges.

The boating and refreshment privileges at City Park are let at present for \$6,500.00 per annum.

At Berkeley Park, boating, refreshments and rental of bathing suits brought the Park Department \$1,000.00 last year.

At Washington Park the Department has for the last two years taken full charge of the bath house—and last year when bids were asked for the refreshment and boating privileges at this park, which in 1913 were let for \$1,000.00, certain conditions confronted the Department and the Park Commission decided to operate the concession themselves.

The gross receipts were close to \$8,000.00 and the cost of operating was about \$5,600.00. The Park Department realizing a profit of between \$2,400 and \$2,500. This was exclusive of bath house.

We employed a woman to take charge of the pavilion at \$100.00 per month for June, July and August, and \$65.00 per month for April, May and September, also in December and January, when the pavilion is open on account of skating.

During the summer when additional help was necessary, also on Sundays and holidays when business warranted it, the person in charge had authority to engage additional help—all help appearing on regular park pay roll.

We endeavored to sell only the very best of everything and purchased all goods at home, and sold as cheaply as consistent with good business principles.

If a refreshment concession is not at least self-sustaining, I do not believe we should operate it, as, in my opinion, it is different than expending money in other departments of the park and might justly be subject to criticism.

I believe it would be a good idea to try renting out concessions in small neighborhood parks to parties living nearby if they were under park control at all times.

Our city does not permit nor do I believe a public park the proper

place for merry-go-rounds, photo galleries, shooting galleries, etc. A public park is essentially for all the people and a man taking his family out to the park does not want to be confronted by these conditions, because a child will invariably ask for everything and it is hard for a parent to have to refuse, which necessity often compels him to do. Should this kind of entertainment be desired, most every city has an amusement park to cater to those desiring this class of amusement.

We do not permit, nor do I think it advisable to have, catch-penny machines in a public park for the same reasons as enumerated in the paragraph above.

TOLEDO, OHIO.

Frank B. Respass, Secretary.

Our concessions are operated by private parties.

This method has not been satisfactory, owing to the fact that we believe we can give the public more for its money and better supplies than private parties as we would endeavor to furnish the public at actual cost.

The contracts are let for the concession under the supervision of the Superintendent of Parks and can be annulled on three days' notice by the Park Commissioners if rules and regulations are not complied with.

We have boating concessions in two of our parks bordering the river and catering concessions in four of our parks.

We advertise for bids for concessions for the season, the concessions being awarded to highest bidder, provided, in the judgment of the Board, bidder is a proper party to conduct concession.

Boating concession in Walbridge Park was let for \$350 for the season of 1914; catering concession at Navarre Park for \$50; catering concession at Ottawa Park for \$100; catering concession in pavilion at Riverside Park for \$50, including boating concession. All of the above contracts being let to the highest bidder who, in the judgment of the Board, was the best. We advertise in the local papers in March for bids for the above named concessions for each season's contracts, which run from April 1st to April 1st.

If in the judgment of the Board the new higher bidder is a proper party to conduct the concession, they, of course, award the contract to that party.

Our Board has always been in favor of conducting its own refresh-

ment stands in the various parks, but owing to lack of funds have been unable to provide equipment for conducting same and consequently have to let contracts to private parties.

We have merry-go-rounds as a part of playground equipment in our various parks. As to shooting galleries, side shows, etc., the Board would not allow same to be placed in the parks under any consideration.

Relative to slot machines would say that there is a city ordinance prohibiting same.

NEW HAVEN, CONNECTICUT.

G. X. Amryhn, Superintendent of Parks.

Our concessions are operated by private parties and we are at present satisfied with this method.

The concessions awarded are for restaurants and refreshment stands. Concessions are awarded to the highest bidder as a rule, provided the standing and ability of the successful bidder is satisfactory and proper bond is furnished. In our case an annual lump sum fee is in force and concessions are awarded or renewed annually.

I do not regard it as advisable to change concessionaires if their service is satisfactory, unless fees offered by others are much larger. In this event our city charter provides that we must take action. So far we have not been forced to take steps to regulate charges, although we reserve the right to do so.

ST. LOUIS, MISSOURI.

Dwight F. Davis, Commissioner of Parks.

Our concessions are operated by private parties, but we are not satisfied with the method and contemplate a change.

We award concessions to the highest and best bidders on a lump sum basis per annum, payable semi-annually, awarding privileges for terms of from two to five years.

Regarding changing concessionaires, we are required by city charter to award same to highest and best bidder. Contracts provide for the charging of reasonable prices.

In our opinion it would be better for the Department to operate all refreshments concessions and boat liveries.

We do not think it advisable to permit merry-go-rounds, photo galleries, shooting galleries or any concessions of that sort in public parks. This also applies to weighing devices, vending machines, etc.

PROVIDENCE, RHODE ISLAND.

Fred C. Green, Superintendent and Secretary.

Our concessions are awarded to private parties, we are satisfied with this system and do not contemplate a change.

Our concessions consist of a carrousel and various refreshment stands, which pay a lump sum fee per annum. We award concessions to the highest and best bidder, but the question of changing concessionaires depend upon the standing of new bidders.

Do not approve of amusement privileges in parks. We have a carrousel, but, personally, I would like to see it discontinued.

We permit weighing machines, but I believe vending machines would be a source of trouble.

HALIFAX, NOVA SCOTIA.

Richard Power, Superintendent of Public Gardens.

Our concessions are operated by private parties and the system we have works well. We charge no fee, simply granting the privilege of serving light refreshments to suitable parties.

We do not permit amusement features, vending machines or anything of that kind in our parks.

ROCHESTER, NEW YORK.

C. C. Laney, Superintendent and Secretary.

Our concessions are operated by private parties. Personally I do not like this method, but the Park Board is unwilling to make a change.

We award concessions for refreshment stands and boat liveries for a lump sum fee per annum for terms of from one to three years. Our refectory fees range from \$450 to \$1,600 per annum; boating concessions, \$400 per annum. We reserve the right to regulate charges and select concessionaires more from their standing than from amount of bid. Do not regard it as advisable to change concessionaires unless fees offered by others are much larger.

I think well of the idea of awarding concessions in small outlying parks to nearby residents, who can operate the same profitably on Sundays or holidays.

We do not permit, nor do I think it advisable to permit, the operation in public parks of commercialized amusements, vending devices, etc.

PORTLAND, OREGON.

E. T. Mische, Landscape Engineer.

Portland refectories are handled by private concessionaires and there is no immediate need of changing method. Operated on the scale at present in vogue, private concessions have been satisfactory but insufficient enterprise has been shown in rendering the service to the public that may reasonably be expected. To do this requires new structures and when these are provided, department control would in all probability be the better method.

Present concessions were awarded by Commissioner of Public Affairs to highest bidders, but in days of a park board, it did not hesitate to select a responsible bidder of demonstrated and known reputation over an unknown or doubtful bidder, even if the latter offered more money. An annual lump sum fee has been the method and required less checking than a percentage system.

Awards in 1914 were \$750.00 and \$250.00 and were for two years' terms. The right to regulate charges is reserved but has never been invoked. Advertisements call for the bidder to list items he proposes to sell and prices he will charge. Service to the public and not exploitation is the essence of the contract.

I think well of the idea of permitting nearby residents to operate stands on Sundays or holidays in outlying small parks. It is desirable to operate all by the Department, but economically and profitably, while unprofitable small projects defect, in a measure, the greatest good to the greatest number.

Do not approve of amusement privileges in parks and it is doubtful if they could be operated satisfactorily by a public body at reasonable cost. I see no good reason why music and theatricals could not be allowed as in Canada they do it and, I think, without reasonable objection.

So far as possible the public should be allowed to care for themselves, individually or in groups. The function of a city administration is primarily to govern. It might be profitable to conduct theatres but

hardly wise or prudent, no more so than to run second hand stores, churches or colleges. The municipality should foster all these but before undertaking them itself it should be where private initiative has failed to provide them or where the best interest of the community is subverted when conducted under control.

TACOMA, WASHINGTON.

George A. Hill, Superintendent of Parks.

Our concessions, all in one park, are operated by the Department, we are well pleased with this system and would not think of making a change.

We operate a cafeteria, refreshment stands and boat liveries, all located in Point Defiance Park, our large park. The gross revenues for 1914 were \$21,294.10 with operating cost of \$20,723.55, or a profit of \$570.55. We employ a special manager working under the direction of the superintendent.

I do not believe it advisable to permit any form of commercialized amusements in the parks and so far our commissioners have taken the same view of it.

We have weighing machines, lifting machines, electric piano and pay telephones, on which we receive a percentage of the revenue.

HOUSTON, TEXAS.

C. S. Brock, Superintendent of Parks.

We have but one concession which we award to private parties. This is a refreshment privilege, for which we receive \$500.00 per annum, awarded to the highest bidder annually. We reserve the right to regulate charges.

In small parks when we have concerts we allow the mothers' clubs the privilege without cost to operate the stands but all profits are devoted to supplying apparatus and paraphernalia for the playgrounds. Do not approve of amusement privileges in parks. City ordinance prohibits any form of slot machines.

SEATTLE, WASHINGTON.

J. W. Thompson, Superintendent of Parks.

We are operating both methods and I am personally satisfied with the results obtained, although I might say that our Board at this time has under advisement the question of the Department taking over and operating all concessions.

We operate a refectory at our Alki bathing beach during a four months' season, the 1914 gross receipts being \$3,184.60; operating cost, \$2,125.31; net revenue, \$159.23.

Our large park concession pays \$800.00 per year and we have had the same concessionaire for eight years although more money has been offered by others. We do not approve of changing concessionaires merely because more money is offered. Standing and ability should be given first consideration.

We have various boating and refreshment concessions awarded at small parks in season with fees of from \$5.00 to \$25.00 per month.

Concessionaire of public comfort station in downtown district pays \$15.00 per month and employs and pays all help for the operation and maintenance of the station.

Man and wife are given lunch concession at golf course club house in consideration of serving without pay as attendants and janitors.

We do not permit and do not approve of commercialized amusements in parks, but I personally favor a merry-go-round, operated by the Department, although we have none, but the success of the one in Golden Gate Park in San Francisco convinces me that they are a good thing.

We do not permit and I do not approve of vending machines, slot devices, etc., in public parks. Catch-penny devices of any kind are out of place in a public park and are a source of dissatisfaction in many ways.

SAMPLE FORM OF CONCESSION SPECIFICATION AS USED IN KANSAS
CITY, MISSOURI.

Specifications

FOR CONTRACT FOR OPERATING REFECTORY AND RE-
FRESHMENT CONCESSIONS IN SWOPE PARK
FOR THE SEASON 1914-15.

Bids will be received by the Board of Park Commissioners for the exclusive contract to operate a cafe and vending stands at the refectory and refreshment booths in Swope Park for the season 1914-1915 on the following conditions:

The season shall be from the 1st day of March, 1914, to the 1st day of March, 1915, and the concessionaire shall agree to operate all concessions during that period.

This concession shall include the exclusive privilege of serving hot food and other refreshments at the refectory and of light refreshments at the booths as follows: Booth "A" near the refectory and Booths "B" and "C" near the Zoological Building, and of selling, vending and dispensing at the refectory and said booths non-alcoholic beverages, popcorn, nuts, confectionery, cigars, tobacco and other refreshments (excepting and excluding, however, any and all alcoholic or intoxicating liquors of every sort), and at such additional points as may from time to time be designated and provided by the Board of Park Commissioners; and the bid shall specify the rate or terms at which such additional service shall be given. The Board of Park Commissioners shall have the right to discontinue any booth at its discretion.

This contract shall not include the right in the concessionaire to sell food or refreshments at or near the boathouse in such a manner as to constitute a violation of the concession heretofore granted to Messrs. Guinotte and McGee.

The concessionaire shall at all times comply with the laws of the state and the ordinances of Kansas City, and the rules and regulations of the Board of Park Commissioners in the government and management of the park.

All foods and articles served or sold under this concession, and the quality thereof, shall be subject to the approval of the Board of Park Commissioners and the prices charged therefor shall at all times be reasonable, consistent with good service, and the Board of Park Commissioners' decision as to the reasonableness of charges shall be final. All schedules of prices shall be furnished to the Board of Park Commissioners before being put into effect. The character of the service shall be the best obtainable, and shall at all times be clean, orderly, sanitary and sufficient to meet the reasonable demands of the public. This Board shall have the right to object to the character of the service and the condition of the premises in any particular and to require that the objectionable service and conditions be discontinued or remedied. The premises shall at all times be kept and maintained in a clean, sanitary and orderly condition, to the satisfaction of the Board of Park Commissioners.

The Board of Park Commissioners reserves the right at any time, when, in its judgment, the manner of operation of the refectory or refreshment booths, or any of them, or the quality and character of service therein, are not fully up to the requirements of this contract, or are not adequately meeting the needs of the public, or in case the concessionaire shall, in the opinion of the Board of Park Commissioners, have violated the terms of this contract, to revoke this contract, first giving days' notice of its intention to do so.

All equipment and property of every description that is owned or furnished by the Board of Park Commissioners, including telephone and lighting fixtures, shall be returned to the Board upon the termination of this contract in as good condition as when received, ordinary and reasonable wear and tear excepted. All dishes and other articles broken, destroyed or lost, and all supplies or other articles, belonging to the city or to any private person, club or association lost, stolen or damaged by said concessionaire, his servants or agents, or by any trespasser, shall be replaced or paid for by the concessionaire.

The Board of Park Commissioners will keep the refectory building and refreshment booths in reasonable repair, except the repair of such damages or injuries thereto as are due to the fault or negligence of the concessionaire, his employes or agents, for which repairs said concessionaire shall be liable. The Board of Park Commissioners will supply electric lighting fixtures in the refectory, but the concessionaire shall pay for all current used, for which purpose a meter shall be in-

stalled. The Board of Park Commissioners will cause to be installed one telephone, for the maintenance of which the Board will pay.

Bids may be upon the basis of a percentage of the gross receipts or upon a lump sum basis, except that no bids based upon a percentage of net profits will be considered. The Board of Park Commissioners shall have the right, and shall be given the opportunity, to inspect and audit the books and accounts of the concessionaire, who shall keep same at all times in such manner as to clearly show the state of the business under this contract. No vending, soliciting or sales of any character shall be carried on or permitted under this contract in any other places than within the buildings and booths herein described or hereafter designated by the Board of Park Commissioners.

The concessionaire shall not assign or have the power to assign this contract or any rights thereunder without the written consent of the Board of Park Commissioners.

The concessionaire shall further furnish a good and sufficient bond to insure the faithful performance of all regulations and park requirements prescribed by the Board of Park Commissioners, the ordinances of Kansas City and the laws of this state, and to insure the performance of the provisions of this contract, including the payment of any and all money which may be or become due to Kansas City under or arising out of this contract, and to save Kansas City harmless from all loss or damages and from all suits or actions of every name and description brought against said city, for or on account of any injury or damage received by any part or parties or to any property, by or from the acts or negligence of the concessionaire, or his servants or agents, in the operation of said cafe, refectory, lunch rooms and refreshment booths, as provided for by this contract, or in consequence of any negligence in caring for the same. Said bond to be approved in form by the city counselor, and the sureties thereon to be approved by the city comptroller.

The concessionaire shall pay all debts incurred by him for the purchase of supplies, material and equipment, and for services of every sort, for use in or in connection with the carrying out of this contract and with the operation and maintenance of this concession, whether such debts are of a kind which the city is legally responsible to the claimant or otherwise.

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Landscape
Garden

BULLETIN No. 13

American Association
OF
Park Superintendents



MUNICIPAL GOLF

Park Acreage, Annual Appropriation,
Water Supply Etc. of 88 American Cities

1917

BULLETIN No. 13

American Association
OF
Park Superintendents



MUNICIPAL GOLF

By J. W. DUNCAN, Superintendent of Parks, Spokane, Washington
B. A. CLARK, Superintendent of Play Grounds, Spokane, Washington

Park Acreage, Annual Appropriation,
Water Supply Etc. of 88 American Cities

By WM. R. READER, Superintendent of Parks, Calgary, Canada

1917

American Association of Park Superintendents

Organized at Boston, Mass., 1898

OBJECT

The acquirement and dissemination of knowledge, theoretical and practical,
relating to the development and maintenance of parks, by means
of social intercourse and friendly interchange of know-
ledge between its members

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*Annual Convention, St. Louis, Missouri,
September 11-13, 1917*



GOLF IN PUBLIC PARKS

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The use of public parks for play or recreation purposes has increased so much during the last two decades that I am greatly in favor of using the word playground in the broad sense of the word. The more we get people to use the parks for play purposes the more we are doing for the benefit of mankind. That our larger parks have not been, nor are they, used nearly to the full extent of their capacity for the enjoyment and recreation of the people is a foregone conclusion. We should, therefore, make every effort to have those larger parks used, not only for the benefit of the few of the aesthetic taste, but also for the recreation of the masses.

While I do not in any way mean to introduce anything that will mar the natural beauties and picturesqueness of our parks yet I think that where ever it can be done Park Superintendents should introduce as much as possible all sorts of games for public recreation.

When the playground movement was first started, playgrounds were not a success when established, until we got men and women who knew and could learn children how to use playgrounds. With the use of the broader meaning of the word playground, let us have all sorts of games and sports in our parks and the one I am advocating in this article is the grand old game of golf. Golf has been more or less played in this Country for the past twenty-five years, and as near as I can learn the first municipal golf course was established in Boston about 1891. Since that time other Park Departments have followed suit; but today instead of every city of any size having a golf course in its parks there are only about sixty municipal golf courses in the whole country. I have communicated with some seventy-five cities of a population of over 25,000 and only slightly more than one-half report having municipal golf courses. While the information I

received was of great value to me I am sure there are others that it is equally or of more value to, and I am, therefore, publishing it in this form for the benefit of all Park Departments and city officials.

Forty cities of over twenty-five thousand population reported having established golf courses in their parks, yet all told the actual acreage reported by these forty cities is only a little over 4,000 acres. One hundred and two acres is the average to the city.

Twenty acres is the smallest course reported and one hundred seventy acres the largest; but I think in this as in some other instances that the whole park acreage was given instead of only the acreage of fairways and greens.

Of the forty cities reporting golf courses seven of them reported having two courses, two reported having three and two reported having four. There are thirty, eighteen-hole courses, twenty-eight, nine-hole courses and two six-hole courses. Considering the whole total of holes and acreage the average per hole is about four and one-half acres.

The longest eighteen-hole course reported is 6,900 yards, and the shortest is 1,645 yards, the average being 2,632 yards.

The cost of maintenance does not seem to have been kept very closely; for the year 1916, \$12,000 is reported the highest and \$1,000 the lowest with an average of \$4,601 for fifteen, eighteen-hole courses. \$5,000 the highest, \$500 the lowest and \$2,283 the average for thirteen nine-hole courses.

The cost of construction and improvement varies a great deal; for twenty-four eighteen-hole courses \$50,000 was the highest reported and \$2,583 the lowest, while the average is \$18,051.

On twenty-two nine-hole courses reported, construction cost \$25,000 for the highest, \$1,200 for the lowest and \$10,026 the average.

It is difficult to compare or determine either the maintenance or construction costs, however, as in some instances the grounds had already been in grass and scarcely needed any grading, while in other cases grading and plowing from the natural rough, had to be done and in some instances water pipe laid all over the course, while others had no water pipe laid at all. On the other hand in the cases of maintenance, some have only charged the work of tending to the game of golf up to the maintenance, charging the mowing, etc., up to the general park maintenance.

Four courses are reported as being under construction and to be ready for use in 1917. Seven were opened for the first time in 1916 and six in 1915 so that every year seems to be adding a few to the list.

Of the courses reported thirty-three are free to the general public and seventeen make charges. The charges range from one to ten dollars per season, from ten to fifty cents per day and from ten to twenty-five cents per game. Thirty-nine clubhouses were reported, all free to patrons; but twenty-nine report locker charges ranging from one to ten dollars per season. Fifteen cities report keeping a professional golfer, in a few cases the professional is in full charge but in most cases the park foreman is in charge of the course. In a few cases the foreman oversees the upkeep and the professional oversees the play. Generally the professional is paid a

small salary and given the privilege of teaching and selling golf necessities. Sometimes the professional has no salary but the concession of teaching and selling golf goods only and in one instance he pays for this concession.

Golf attendants are; green keepers, caddy masters, rangers, checkers and clubhouse attendants. Their salaries and pay varies according to the geographical location. Attendants receive generally from \$45 to \$60 per month, foremen receive from \$2.50 per day to \$1,300 per year while laborers receive from \$1.75 to \$3.00 per day.

Women were reported in every case to have same privileges as men. Year round seasons were reported in several instances with the average from April first to December first.

Per capita cost was only reported by three cities, by this was meant the cost to the city per game for a player. One reported eight cents, one reported twenty-four and one reported fifty cents per game. The information per city as reported is shown on the supplemental chart at the back of this pamphlet.

An important feature in the management of a golf course is the rules governing the conduct thereof. I believe that the more concise and pertinent we can get any form of Park Rules the more valuable they are. The public will not stop (nor should they be asked) to read a lengthy set of rules of any form. It would therefore be borne in mind that when you formulate your rules, boil them down. Of course, no set of rules will hold fast for all sections of the country but the following are about as terse as any I have seen and while they may have to be changed somewhat to suit conditions they form the nucleus of the rules governing the game.

GENERAL RULES FOR MUNICIPAL GOLF COURSES

The municipal golf course is for all persons, and in order that all who wish to play may properly enjoy the game it will be necessary that these rules are complied with. Conscientious observance of these rules is therefore obligatory on all players. The plea of ignorance of the game will not be accepted.

It is the duty of the custodian in charge to enforce the rules, and his decision shall be final.

Persons using the course must have had experience as players, and hold a permit from the Park Commission, which may be obtained on application to the custodian. The custodian is authorized to exclude from the course any person who is not sufficiently familiar with the game to play without incommoding or endangering other players.

At first tee all players must take their turn according to arrival. All matches must start at the first tee. No special reservation of the grounds or special permit for the use of the golf course will be made.

Persons not familiar with the game may receive instruction from any competent teacher, but must not interfere with regular players with the use of the course.

The caddy master will have charge of all caddies, and will keep a record of their names and the numbers of their badges.

No caddy will be allowed to solicit employment without his badge, and he must not solicit employment beyond the first tee.

Any caddy found guilty of purloining balls, or of any other misconduct will be summarily discharged.

The pay of a caddy shall be at the rate of.....cents per hour.

No person, either player or caddy, shall be permitted to sell golf balls on the course and it shall be equally offensive for parties to purchase golf balls from persons not authorized by the Board of Park Commissioners. This rule shall be strictly adhered to and persons failing or refusing to observe the same, shall be barred from the course.

Golf balls found in the park must be returned to the custodian and can be redeemed by the owner if his initials appear on the ball.

Golf sticks, clothing and other material left in the golf course building is at the owner's risk. Reasonable care will be taken during the hours the building is open.

Players must wear shoes without heels or shoes with broad flat heels. High heels will not be permitted on the course.

Players will at all times use proper care. Any person causing accidents through neglect or carelessness will be personally held responsible.

GROUND RULES

Players must not loiter about the first tee, but play off in their turn as rapidly as possible, to make room for those following.

No player should play from the tee until the players in front have played their second stroke and are out of range.

No player should play to the putting green until the players in front have holed out and moved away, and players who have holed out should not try their putt over again or stay on the green, but move away at once.

Players looking for a lost ball must allow any other players coming up to pass them.

A ball driven into newly planted ground must be lifted and dropped outside; no ball shall be played from planted ground.

Players must use the tee and not drive from the turf.

When the course is crowded no match other than a twosome, or a two ball foursome will be permitted.

Single players will be allowed the use of the course only at the discretion of the custodian.

A ball driven on or across any road is out of bounds.

Driving from a putting green is not permitted, nor placing golfbags or other articles thereon.

The player whose ball is farthest from the putting green, must play first, while his opponent must remain back and out of range of the player's ball.

All trees are hazards--balls must be played as they lie. Water plugs, sandboxes and other equipment, including movable objects are not hazards.

Casual water, mud, etc., are not hazards; ball may be lifted and dropped over shoulder, not nearer hole, without penalty.

When the course is crowded, inexperienced players, or those who might delay the game, will not be allowed to play. The custodian will enforce this rule, in his best judgment, for the fullest use of the course.

Turf cut and displaced by a stroke must be at once replaced by the player making the stroke.

The custodian shall have full charge of the game, and complaints and violations of the rules governing the same, by any player, may be made to him.

Players using the check room will please show their checks when claiming clubs or other property.

Analyzing the foregoing it would seem that the game of golf should receive the consideration of all park departments whether or not they have a park suitable; if they do not have one, they should make an effort to acquire one.

An eighteen-hole course of not less than 6,000 yards is the ideal public course, the length of holes to vary according to the layout of the course taking advantage of the topography of the location. Few hazards should be in a public course because it is the masses of players that have to be catered to and not the few expert players, who generally can take advantage of belonging to some golf or country club.

If only a nine-hole course is available it should be as nearly 3,000 yards long as possible and so laid out as to allow the largest number of players using it without their being held back by unnecessary slow play of the beginners, by that I mean there should be no unusual hazards.

The management of the course is a matter that can only be decided by the conditions that pertain in the locality where the course is located. It seems to me, however, that the man to be in charge of the course should be the park foreman, who should be familiar enough with the game to regulate his keeping the course at all times in the best of condition. Under his direction and immediately in charge of the play should be a game director whose duties should be to regulate the play all over the course. The director should have an assistant known as a ranger, who might well be equipped with a bicycle or motorcycle to facilitate his quickly getting over the course. Another assistant to the director should be a caddy master; whose duty should be, as well as taking charge of the caddies, the proper decorum at the starting point or first tee. Conditions are so different that no two departments may be able to manage their courses alike and again it largely depends upon the amount of money available for the upkeep of the course.

I do not think that a professional golfer should have charge of a municipal course; if it is absolutely necessary to have one for the purpose of teaching he should have a concession for so doing and should for such concession return the department remuneration in some way.

In some large cities the number of players are so great that extra methods of handling the players have to be adopted and I quote from a letter from Mr. Foster of the South Park System, Chicago, as follows:

CHICAGO REGISTRATION SYSTEM

"The eighteen-hole course in Jackson Park has a shelter and a lunch room, and shower baths and in close proximity to these buildings, two toilet rooms. The locker room has about 750 lockers, for the use of which there is no charge. The demand is so great for them that four people are assigned to each locker. There is no charge to the public for towels or soap, or any charge to players. The eighteen-hole course in Jackson Park, which is the largest, is in charge of a Head Attendant, who also has charge of the shelter. The lunch room is a concession. There is one starter, on duty at the first tee and during the season of the year when the playing is greatest there are two or three checkers on the course to see that there is no cutting in. There is also one man directly in charge of the greens under the maintenance foreman of the Park, who calls to his assistance men from the Maintenance Foreman when they are needed. The fair green is attended to by the Maintenance Foreman of the park. At the other courses there are only one starter and checkers on the course when needed. One of the park Maintenance Foreman's men is detailed to look after the green.

"The method of starting players is as follows: At the eighteen-hole course, which is the busiest, there are registration sheets, one for each day, always to be seen at the head attendant's window. The sheets are in view for seven days ahead. Registrations are made for foursomes at intervals of ten minutes commencing at 5:20 in the morning until 6:20 in the evening. The person registering signs his name on the sheet and receives a ticket stamped according to the time he has registered. On coming to place he presents his ticket with the hour of playing stamped on it and signs his name opposite where he signed his name at the time of registration. This is for identification.

"Those who come to play, who have not registered receive a ticket with a number stamped thereon and sign their name on another sheet. When their numbers are called to make up a foursome they sign their names on the identification sheet, have their tickets punched. These are called casual players.

"A registered foursome goes out, then a casual foursome, then a registered foursome, etc.

"The registration system has not been adopted in Marquette Park, but will be this coming year, it is expected.

"We have no professionals in the service and no effort is made by the Park Commissioners towards instruction, although practice ground is provided in a few places, to a limited extent. The courses are opened in the spring just as soon as the snow and ice leaves and are open until snow and ice prevents playing. Some golfers play anyway all winter, but there are no attendants during the months of December, January and February. Women have the same privileges as men. No concessions are granted except for the lunch counter service at the eighteen-hole course in Jackson Park. Clubs are not recognized although they play off tournaments and to do so make registrations for foursomes, the same as individuals."

Much might be written about the methods of laying out and building a golf course, the best grasses to use, etc., but again conditions vary so much that one section of the country may be entirely different from another. I will say this, however, that the fairways should all be deeply plowed and properly graded before seeding. If necessary they should all have a water system for the dry season. We have to water all of ours for at least three months of the year. The grasses to use in the fairways differ, although, the chief factors of the combination should be; bluegrass, red top, creeping bent, English rye and the addition of one or more of the fescues. White clover should always be omitted.

The putting greens should be perfectly level not less than seventy-five feet in diameter though they need not necessarily be all one shape, in fact, it is better to vary them if conditions will permit. Various grasses are used with good success according to locality but here we have found that creeping bent, and a little crested dogs tail make a good combination.

A great deal might be written about the general upkeep of the grounds, but that again varies so much according to location. We mow our course about twice every ten days during the growing season and the putting greens are mowed and rolled regularly as required. We find that the triplex mower is the most economical, it has a cut of over eighty inches and one horse can handle it easily, besides one machine will mow our whole course in about two and a half days. Heavy machines like the auto mower, are not economical unless the ground is practically level, besides so much rolling as they give is not good for the grass in the dry, hot season.

Every course should have a golf house for the accommodation of its patrons. This house should contain ample checking and locker room, dressing rooms with toilet and shower bath facilities for both men and women, repair and accessory room and perhaps a lunch counter.

A golf course may be itemized as follows: Length, 6,000 yards for eighteen holes, 3,000 yards for nine holes. Fairways, one hundred fifty to two hundred feet wide. Putting greens, seventy-five feet in diameter. Tees, six by eight feet. This will occupy from fifty to one hundred acres actually devoted to the course.

It is surprising to find how few of the departments can tell actually what the maintenance of a golf course is. I believe this is an item that should easily be taken care of and be of much value to the department. I believe that all municipal golf courses should be free of charge to the public. Occasionally we find, however, as in the case of Spokane, conditions prevailing where a charge is necessary. I think also that it is a grave mistake for any park department to give the charge of its course over to any private club. I believe that Park Commissions are put in charge same hole, and when remonstrance was made by those who supposedly had the right of way, they were politely told to mind their own business. It will ever be thus where new beginners are coming on to the course every other day, and for that reason I believe the fewer hazards there are the better will be achieved the results for which the park boards are looking. The fewer short holes there are in a public course the better, and then they ought not to be of such a hazardous nature as to cause congestion; if they are of such a character, you again defeat your own ends, the course

being "all gummed up" at that particular point. The public courses are also a means to an end; they are the nurseries of the country clubs and the golf clubs, and, as their players gain proficiency and advance in business affairs they will seek affiliation with golf and country clubs. The game of golf has a wonderful fascination for people, and it is something that holds.

LAYING OUT THE COURSE

Public golf courses should not be less than 6,500 yards long where possible. Ground of a slightly undulating nature should be secured. The less planting of trees and shrubbery indulged in inside the course the better. There are usually plenty of opportunities for the landscape architect to get in his work outside the precincts of a golf course, but when a landscape architect has anything to do with a project of this kind he too often makes the golf course subservient to his architectural designing. This, I believe, is altogether wrong. The golf course architect is the man who should be first considered in this work, there are opportunities for decorative treatment, they will be so apparent as to leave no ground as to how and where they should be used.

I believe it wise that these matters should come under the authority of the park department, which is more in touch with the subject than is any other of the civic bodies. The department should be as willing to pay for expert advice along this line as along any other line upon which it seeks assistance.

In laying out a public course, I believe it is well to take the whole extent of the property by going around it just as far as possible to begin with, not bringing back the ninth hole to anywhere near the starting point, but allowing that to be as far from the first tee as you can. Put the first hole at such a distance as to take care of as many players as possible—say about 440 yards; the next hole could be from 150 to 226 yards; then of various lengths up to, say, the tenth hole, extending from a drive and a mashie to a drive and a brassie. A longer hole could then be added, followed by a short hole; the fourteenth should complete all the short holes on the course. Of course these distances are arbitrary, and the nature of the ground and its extent should determine these points for the one who is mapping out the course, but these suggestions will give some idea of the course that will give the greatest good to the greatest numbers.

DETAILS OF MANAGEMENT

I do not believe that any fee should be charged on a public course. The park boards receive their share of public taxes, and appropriations ought to be made for the maintenance of the golf courses as well as for the maintenance of any other department of the public parks. Baseball of their departments and they should absolutely control all their various branches by their own employees, letting out no concessions whatsoever. Again I will have to admit that in some instances conditions will not permit of this but until this is done, the best service is never given, nor will the public be served so well, nor a Park Commission perform its duties so well as was intended when given the trust it has.

The following extract from an article by Mr. Bendelow, Golf Architect, Chicago, in a recent number of "American City," is in my estimation very much to the point and is therefore herewith inserted.

(Extract from "MUNICIPAL GOLF" by Tom Bendelow, Golf Architect, Chicago, Ill., appearing in the July, 1916, AMERICAN CITY.)

THE BENEFIT OF GOLFING

The advantages of this game over all others are readily apparent. In a baseball game you see eighteen athletes participating, while, it may be, thousands look on. If the day happens to be a raw one the onlooker is certainly apt to catch a severe cold, which may incapacitate him from work for a while or have more serious results. The same is true of many other games, but with golf the conditions are entirely different. Few people care to watch it, and those few are really the devotees of the game; consequently the vast majority play—young as well as old, men as well as women. It takes them out in the open air, giving them all the walking they want, for in accomplishing a round of eighteen holes they will cover at least six or seven miles. Think of the form of exercise they are getting—the swinging of the arms, the greatest invigorator for a sluggish liver—and all the time out of doors, breathing pure ozone, while as a mental relaxation there is nothing to beat it in the wide world, for it takes the mind from everything else and centers it on what one is doing.

The implements used in playing the game are now produced at such reasonable cost that they are within reach of all, and, with the courses maintained at public expense, there is no reason for the average citizen's being without this form of exercise because he cannot afford it.

REGULATING A PUBLIC GOLF COURSE

Golf courses in public parks under city control can be made much more advantageous than they have been up to the present time. Park commissioners should foresee this one thing—that they should secure the greatest good for the greatest number. "Safety first" should be one of most important requisites in the laying out of a golf course. One thing there should not be in a public course, in my opinion, if this end is to be achieved; that is, water hazards of lagoon type, which are nothing more or less than a means of congesting a golf course. Hazards should be of very simple nature, and not of such character as to impede progress; in the latter case it is impossible for a public course to be as well regulated as a country club course. A country club has its membership, who are well educated as to what a golfer's duties are to himself as well as to the other players; consequently there is very much more consideration shown for one another. On a public course, where everyone thinks he has as much right as another to do what he jolly well pleases, it is impossible to regulate the players after they have left the tee. I have seen three or four players, belonging to different parties, in a bunker, playing for the players who take advantage of diamonds in the public parks do not pay any charges for the privilege; why should golfers. There is no reason in the world for it that I can see.

Custodians should be appointed to look after the conduct of the course seeing to it that the rules are put up in conspicuous places, so that all

who run may read. There ought to be an employee whose duty it should be to start the people off in entire accordance with the rules of the game. I believe park boards have made a mistake in the past by appointing to such positions men who do not know the first thing about the game and its requirements, and who therefore are unable to give to the matter the attention which their position demands.

CLUBS AND TOURNAMENTS

The writer was one of the organizers of the first club on a public golf course, and, in fact, helped to organize golf clubs on the first public course laid out. The minute this was done certain people who did not join these organizations raised a hue and cry, claiming that the golf club members would be seeking all sorts of favors from the park board when tournaments were going on. Such a thing was never dreamed of, however; the writer, coming from Scotland, and having learned the game on the municipal links in that country, knew full well that no such favors could be granted and that none would be asked. This is as it should be on a public course; no one has any right over another in the exercise of his prerogative. The golf club is a good means of simplifying many of the troubles that occur, for the officers see to it that the club members are thoroughly schooled in the etiquet of the game, thus becoming more amenable to the rules that govern all public courses. Hence park boards should encourage the formation of clubs instead of looking upon them as a detriment.

Tournaments are fine things for stimulating interest, and it would not work very much hardship on the players of the public course if the park commissioners deemed it wise to set aside two or three days several times during the season for the pulling off of the championships. This is done at all country clubs, and it is found to encourage play in a marked degree. It works very little harm to the majority of players, who do not compete but who have an opportunity to get some good object lessons as they follow around.

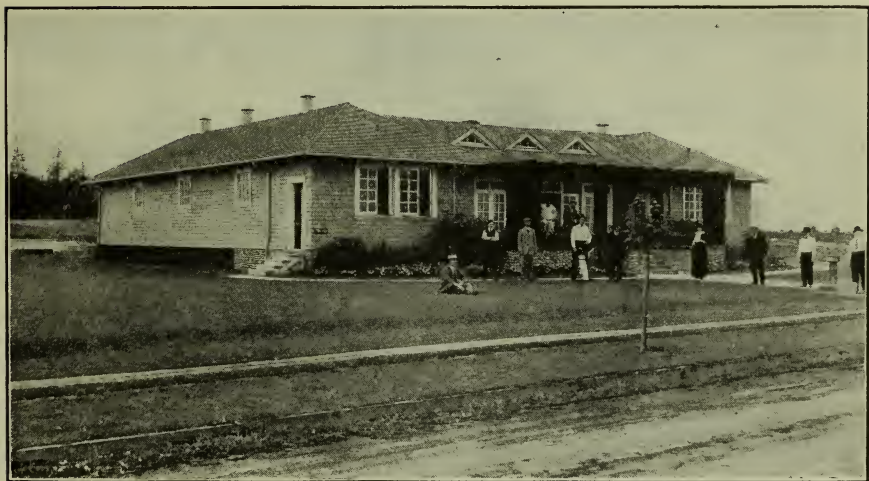
THE CADDIES

One of the worst nuisances on a public course is the unregulated caddy question. When it is regulated, however, the conditions are quite the opposite. This is a matter which ought to be managed by those in authority. It is done to good advantage in clubs, why not in public parks? If the park departments would hire people equipped to handle the matter, it could be taken care of without any trouble. There should be little or no extra cost for this element of maintenance. The park has to be maintained in any case, and appropriations are set aside for the purpose. It may be that this expenditure will have to be put under a different caption, but it all comes under park maintenance, and if a certain amount of money is set aside for the maintenance of a park of 500 acres, an amount should be prorated for the maintenance of 100 acres of the park as a golf course. If the money is used intelligently to get the right class of men in authority—men who actually know something about the undertaking—there will be little difficulty in avoiding trouble. There should be enough money to employ a caddy master and enough other men to educate the caddy boys as to their duties and their behavior. With the course properly policed, the nuisance of losing golf balls by thievery would be practically eliminated.

Boys who found that they could be employed as caddies in regular fashion would readily accept the work under proper management, and there would consequently be little danger of their finding opportunities for purloining the balls. The less shrubbery the better, for this is another cause of lost balls and consequently congestion on the links.

SHELTER

I believe it is to the interest of park departments to maintain shelters for the convenience of all players, whether of golf, tennis, baseball or football. They have a right to expect it. Locker accommodations should also be provided for by a certain share of the maintenance appropriations.





AMERICAN RAILWAY PUBLISHING CO.
SEATTLE

Park Acreage, Annual Appropriation, Water Supply Etc.

OF 88 AMERICAN CITIES

Compiled by Wm. R. Reader, Superintendent of Parks, Calgary, Canada

Name of City, State or Province—	Population	Average of Parks and Boulevards	Annual Park Appropriation	Ownership of Water Supply	Amount Paid Annually for Water	How Rated
Albany, New York.....	110,000	410 acres	\$ 94,000.00	Municipal	No charge	.....
Austin, Texas	40,000	150 acres	.....	Municipal	No charge	.....
Bay City, Michigan	55,000	27 acres	18,000.00	Municipal	No charge	.....
Bellingham, Washington	32,000	150 acres	10,000.00	Municipal	No charge	.....
Berkeley, California	60,000	26 acres	15,500.00	Private	.....	Meter
Birmingham, Alabama	150,000	585 acres	141,000.00	Private	\$250.00	Meter
Buffalo, New York	470,000	1,230 acres	384,155.58	Municipal	\$9,925.00	Both
Cedar Rapids, Iowa	41,000	230 acres	30,000.00	Municipal	No charge	.....
Chattanooga, Tennessee	65,000	274 acres	12,000.00	Private	No charge	Meter
Chicago (South Parks), Illinois.....	2,610,000	2,494.59 acres	3,415,922.00	Municipal	\$2,500.00	Meter
Chicago (West Parks), Illinois.....	2,610,000	1,252 acres	1,600,000.00	Municipal	No charge	.....
Cincinnati, Ohio	425,000	2,552 acres	100,600.00	Municipal	No charge	.....
Colorado Springs, Colorado.....	35,000	2,500 acres	26,500.00	Municipal	No charge	.....
Council Bluffs, Iowa	35,000	793 acres	21,000.00	Municipal	.....	Meter
Dallas, Texas	150,000	394 acres	120,000.00	Municipal	\$1,500.00	Both
Dayton, Ohio	140,000	200 acres	20,507.85	Municipal	No charge	.....
Davenport, Iowa	50,000	125 acres	45,000.00	Private	\$600.00	Meter
Denver, Colorado	250,000	1,400 acres	310,000.00	Private	\$16,398.59	Meter
Decatur, Illinois	45,000	170 acres	26,500.00	Municipal	No charge	.....
Des Moines, Iowa	105,000	717.25 acres	50,000.00	Private	No charge	.....
Detroit, Michigan	800,000	1,196 acres	388,350.00	Municipal	No charge	.....
Dubuque, Iowa	47,000	145 acres	20,000.00	Municipal	No charge	.....
Duluth, Minnesota	100,000	441.32 acres	38,000.00	Municipal	No charge	.....
Fresno, California	40,000	123 acres	250,000.00	Municipal	\$700.00	Meter
Galveston, Texas	42,000	32 acres	7,000.00	Municipal	Parks system	.....
Houston, Texas	125,000	800 acres	86,000.00	Municipal	No charge	.....
San Jose, California	30,000	650 acres	20,000.00	Private	\$2,500.00	Meter
Joliet, Illinois	36,000	80 acres	7,000.00	Municipal	No charge	.....
Kansas City, Missouri .....	.....	.....	360,000.00	Municipal	No charge	.....
La Crosse, Wisconsin	36,000	900 acres	14,000.00	Municipal	No charge	Meter
Lawrence, Mass.	95,000	165.84 acres	18,000.00	Municipal	No charge	.....
Lexington, Kentucky	39,000	68½ acres	25,000.00	Municipal	No charge	Meter
Lincoln, Nebraska	55,000	146 acres	34,500.00	Private	No charge	Meter
Little Rock, Arkansas	65,000	25 acres	.....	Municipal	No charge	.....
Los Angeles, California	575,000	4,124.772 acres	205,396.00	Private	No charge	.....
Louisville, Kentucky	250,000	1,800 acres	140,000.00	Municipal	No charge	Meter
Memphis, Tennessee	200,000	1,265 acres	187,000.00	Municipal	No charge	Meter
Milwaukee, Wisconsin	448,765	1,000 acres	254,000.00	Municipal	No charge	.....
Minneapolis, Minnesota	365,000	3,821 acres	485,000.00	Municipal	\$23,000.00	Meter
Muscogee, Oklahoma	40,000	300 acres	3,000.00	Municipal	\$2,400.00	Meter

PUBLIC GOLF COURSE STATISTICS RECEIVED IN RESPONSE TO INQUIRIES BY AUTHOR

CITY	Acreage	Number of Holes	Length of Course	Cost of Construction	What Year Established	Maintenance Per Year	Is Course Free to Players	Charge to Player, if Any	Have You a Club House	Is It Free	Locker Charge, if Any	Official in Charge of the Course	Assistants	Is a Professional Employed	Have Women Same Privileges as Men	Length of Season	Concessions
Baltimore, Md.	92	18	4,203	1916	Yes	Yes	Yes	Yes	Yes	Yes	\$1 per year	Dist. foreman	Instructor, labor's	Yes	Yes	All year round	
Boston, Mass.	100	9	3,132	1895	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Greenkeeper	Laborers	No	Yes	May 1 to Dec. 1	
Boston, Mass.	6	1,131	1895	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Greenkeeper	Laborers	No	Yes	May 1 to Dec. 1	
Bridgeport, Conn.	25	9	1,645	1914	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Laborers	Laborers	No	Yes	May 1 to Dec. 1	
Buffalo, N. Y.	125	18	5,346	1905	1,400	Yes	Yes	Yes	Yes	Yes	\$5 per year	Park foreman	Laborers	No	Yes	Apr. 1 to Dec. 1	
Calgary, Can.	93	18	5,562	2,583	1915	1,337	No	\$5 year, 25c day	Yes	Yes	Yes	Park foreman	Laborers	No	Yes	Apr. 1 to Dec. 1	
Chicago: North Park.	75	9	3,352	25,000	1914	Yes	Yes	Yes	Yes	Yes	Yes	Park foreman	Laborers, starter	No	Yes	Apr. 1 to Dec. 1	Lunch counter
Chicago: West Parks.	24	9	2,000	1908	Yes	Yes	Yes	Yes	Yes	No	Yes	Park foreman	Lab. & attendants	No	Yes	Apr. 15-Dec. 1	
Chicago: South Parks.	30	9	1899	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Head attendant	Starter, checker	No	Yes	Apr. 1-Dec. 1	Lunch counter
Chicago: South Parks.	70	18	1902	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes			No	Yes	Apr. 1-Dec. 1	
Chicago: South Parks.	40	18	1914	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes			No	Yes	Apr. 1-Dec. 1	
Cincinnati, Ohio	80	18	4,190	6,000	Yes	No	Yes	Yes	Yes	Yes	Yes	Park foreman		No	Yes		Golf teaching, etc.
Cincinnati, Ohio	17	9	2,108	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Park foreman		No	Yes		
Cincinnati, Ohio	24	9	2,112	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Park foreman		No	Yes		
Cleveland, Ohio	125	18	6,820	1915	6,000	Yes	Yes	Yes	Yes	Yes	25c per day	Park foreman		Yes	Yes	May 15-Oct. 15	
Danville, Ohio	30	6	1,258	3,000	1913	1,600	Yes	Yes	Yes	No	Yes	Park foreman	Laborers	No	Yes	May 1-Jan. 1	
Denver, Colo.	130	18	6,900	35,000	1913	Yes	Yes	Yes	Yes	Yes	\$3 per year	Park foreman		Yes	Yes	All year round	
Denver, Colo.	18	No other details given															
Des Moines, Iowa	190	18	5,536	15,000	1902	3,000	Yes	Yes	Yes	Yes	Yes	Custodian	Laborers	No	Yes	All year round	
Des Moines, Iowa	18	No other details given															
Elgin, Ills.	60	9	3,357	3,000	1906	1,800	Yes	Yes	No	Yes	Yes	Custodian		No	Yes	May 1 to Dec. 1	Golf privilege
Hartford, Conn.	80	18	5,520	25,000	1906	1,601	Yes	Yes	Yes	Yes	\$5 per year	Park foreman	Laborers	No	Yes	May 1 to Dec. 1	Golf privilege
Indianapolis, Ind.	101	18	6,000	1895	4,500	No	\$5 mo., 50c day	Yes	Yes	Yes	\$5 per year	Custodian	Professional	Yes	Yes	All year round	
Indianapolis, Ind.	85	18	6,000	Yes	2,500	Yes	Yes	Yes	Yes	Yes	\$5 per year						
Indianapolis, Ind.	60	18	3,000	1,000	No	\$5 per year	Yes	Yes	Yes	Yes	\$5 per year						
Kansas City, Mo.	60	9	2,556	3,200	1900	1,289	Yes	Yes	Yes	Yes	\$3 per year	Park foreman	Laborers	No	No	All year round	
Louisville, Ky.	70	18	4,805	1915	6,700	Yes	Yes	Yes	Yes	Yes	\$8 per year	Professional	Laborers	Yes	Yes	All year round	Refectory, Prof.
Los Angeles, Cal.	150	18	5,423	5,000	1914	5,000	Yes	Yes	Yes	Yes	Yes	Park foreman	Greenkpr., C. M.	No	Yes	All year round	Refectory priv.
Minneapolis, Minn.	50	9	1916	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes						
Newark, N. J.	60	9	3,027	14,887	1916	5,000	No	\$1 year, 25c day	Yes	Yes	\$2.50 per year	Professional	Laborers	Yes	Yes		
New Orleans, La.	20	9	2,410	1915	2,040	No	\$2 mo., 50c day	Yes	Yes	Yes	\$2 per year	Park foreman	Cashier, policeman	No	Yes	All year round	
New York, N. Y.	93	18	6,316	Yes	No	\$1 per year	Yes	Yes	Yes	Yes	\$5 to \$12.50 per year according to whether 1 to 3 use	Park foreman	Laborers				
New York, N. Y.	77	18	5,340	9,965	No	The \$1 admits to any N. Y. course	Yes	Yes	Yes	Yes	Yes						
New York, N. Y.	72	18	5,205	12,395	1914	No	No	No	No	No	No						
New York, N. Y.	18	5,323	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Park foreman	Laborers				
Omaha, Neb.	20	9	1,930	8,000	Yes	Yes	Yes	Yes	Yes	Yes	\$2.50 per year	Park foreman	Laborers				
Pittsburg, Pa.	80	18	4,610	1896	4,800	No	\$1 per year	Yes	Yes	Yes	\$2 per year	Park foreman	Instr., caddy mast.	Yes	Yes	May 1-Dec. 1	Golf privilege
Peoria, Ill.	45	9	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes						
Philadelphia, Pa.	90	18	6,290	1916	Yes	Yes	Yes	Yes	Yes	Yes	Yes						
Racine, Wis.	60	9	2,100	15,000	1913	4,000	Yes	Yes	Yes	Yes	\$2.50 per year	Professional	Clubhouse attdts.	Yes	Yes	May 1-Dec. 1	Golf privilege
Rochester, N. Y.	100	18	5,844	1903	Yes	Yes	Yes	Yes	Yes	Yes	\$1 per year	Park foreman	Laborers	No	Yes	May 15-Dec. 1	
Rockford, Ill.	55	9	3,402	1912	2,000	Yes	Yes	Yes	Yes	Yes	Yes	Park foreman	Laborers	No	Yes	Apr. 1-Jan. 1	
San Antonio, Tex.	85	18	6,010	15,000	1912	Yes	Yes	Yes	Yes	Yes	Yes	Manager	Asst.; greenkpr.	Yes	Yes	All year round	Golf privilege
San Francisco, Cal.	43	9	2,627	20,000	1909	2,200	Yes	Yes	Yes	Yes	Yes	Park foreman	Laborers	No	Yes	All year round	
Seattle, Wash.	101	18	6,095	50,000	1915	12,000	No	\$6 year, 25c game	Yes	Yes	\$6 per year	Park foreman	Starter, C. M.	Yes	Yes	All year round	Golf privilege
Spokane, Wash.	50	9	2,826	13,000	1916	4,000	No	\$10 year, 25c day	Shelter	House only	Yes	Park foreman	Caddy master	Yes	Yes	May 1-Dec. 1	Restaurant, Prof.
Spokane, Wash.	60	9	2,432	1,200	1914	500	Yes	Yes	Yes	Yes	\$3 per year	Park foreman	Laborers	No	Yes	All year round	
Springfield, Ill.	90	9	2,385	3,500	2,000	Yes	Yes	Yes	Yes	Yes	\$3 per year	Custodian	Laborers				
Syracuse, N. Y.	60	9	2,330	1910	2,500	Yes	Yes	Yes	Yes	Yes	\$3 per year	Custodian	Laborers				
St. Louis, Mo.	266	18	5,529	16,768	1912	6,513	Yes	Yes	Yes	Yes	\$2 per year	Park foreman	Laborers	No	Yes	May 1-Dec. 1	
St. Louis, Mo.	9	3,015	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Overseer	Laborers	Yes	Yes	All year round	Refectory, Prof.
Toledo, Ohio	170	18	6,068	15,800	1900	2,700	No	\$3 per year	Yes	Yes	\$5 per year	Park foreman	Laborers	Yes	Yes	Apr. 1-Dec. 1	
Utica, N. Y.	50	9	3,688	1916	Yes	Yes	Yes	Yes	Yes	Yes	Yes					May 1-Oct. 15	
Wilkes-Barre, Pa.	135	9	Temporary for 1916	to be enlarged	Yes	Yes	Yes	Yes	Yes	Yes	Yes						
Worcester, Mass.	60	9	2,902	1915	2,400	Yes	Yes	Yes	Yes	Yes	\$2 per year	Park foreman	Laborers	Yes	Yes	May 1-Dec. 1	Golf privilege

Park Acreage, Annual Appropriation, Water Supply Etc.

OF 88 AMERICAN CITIES

Compiled by Wm. R. Reader, Superintendent of Parks, Calgary, Canada

Name of City, State or Province—	Population	Acreage of Parks and Boulevards	Annual Park Appropriation	Ownership of Water Supply	Amount Paid Annually for Water	How Rated
Albany, New York	110,000	410 acres	\$ 94,000.00	Municipal	No charge	.....
Austin, Texas	40,000	150 acres	.....	Municipal	No charge	.....
Bay City, Michigan	55,000	27 acres	18,000.00	Municipal	No charge	.....
Bellingham, Washington	32,000	150 acres	10,000.00	Municipal	No charge	.....
Berkeley, California	60,000	26 acres	15,500.00	Private	.....	Meter
Birmingham, Alabama	150,000	585 acres	141,000.00	Private	\$250.00	Meter
Buffalo, New York	470,000	1,230 acres	384,155.58	Municipal	\$9,925.00	Both
Cedar Rapids, Iowa	41,000	230 acres	30,000.00	Municipal	No charge	.....
Chattanooga, Tennessee	65,000	274 acres	12,000.00	Private	No charge	Meter
Chicago (South Parks), Illinois	2,610,000	2,494.59 acres	3,415,922.00	Municipal	\$2,500.00	Meter
Chicago (West Parks), Illinois	2,610,000	1,252 acres	1,600,000.00	Municipal	No charge	.....
Cincinnati, Ohio	425,000	2,552 acres	100,600.00	Municipal	No charge	.....
Colorado Springs, Colorado	35,000	2,500 acres	26,500.00	Municipal	No charge	.....
Council Bluffs, Iowa	35,000	793 acres	21,000.00	Municipal	.....	Meter
Dallas, Texas	150,000	394 acres	120,000.00	Municipal	\$1,500.00	Both
Dayton, Ohio	140,000	200 acres	20,507.85	Municipal	No charge	.....
Davenport, Iowa	50,000	125 acres	45,000.00	Private	\$600.00	Meter
Denver, Colorado	250,000	1,400 acres	310,000.00	Private	\$16,398.59	Meter
Decatur, Illinois	45,000	170 acres	26,500.00	Municipal	No charge	.....
Des Moines, Iowa	105,000	717.25 acres	50,000.00	Private	No charge	.....
Detroit, Michigan	800,000	1,196 acres	388,350.00	Municipal	No charge	.....
Dubuque, Iowa	47,000	145 acres	20,000.00	Municipal	No charge	.....
Duluth, Minnesota	100,000	441.32 acres	38,000.00	Municipal	\$700.00	Meter
Fresno, California	40,000	123 acres	250,000.00	Municipal	Parks system	.....
Galveston, Texas	42,000	32 acres	7,000.00	Municipal	No charge	.....
Houston, Texas	125,000	800 acres	86,000.00	Municipal	No charge	.....
San Jose, California	30,000	650 acres	20,000.00	Private	\$2,500.00	Meter
Joliet, Illinois	36,000	80 acres	7,000.00	Municipal	No charge	.....
Kansas City, Missouri	.....	.....	360,000.00	Municipal	No charge	.....
La Crosse, Wisconsin	36,000	900 acres	14,000.00	Municipal	No charge	Meter
Lawrence, Mass.	95,000	165.84 acres	15,000.00	Municipal	No charge	.....
Lexington, Kentucky	39,000	68½ acres	25,000.00	Municipal	No charge	Meter
Lincoln, Nebraska	55,000	146 acres	34,500.00	Private	No charge	Meter
Little Rock, Arkansas	65,000	25 acres	.....	Municipal	No charge	.....
Los Angeles, California	575,000	4,124.772 acres	205,396.00	Private	No charge	.....
Louisville, Kentucky	250,000	1,800 acres	140,000.00	Municipal	No charge	Meter
Memphis, Tennessee	200,000	1,265 acres	187,000.00	Municipal	No charge	Meter
Milwaukee, Wisconsin	448,765	1,000 acres	254,000.00	Municipal	No charge	.....
Minneapolis, Minnesota	365,000	3,821 acres	485,000.00	Municipal	\$23,000.00	Meter
Muscoogie, Oklahoma	40,000	300 acres	3,000.00	Municipal	\$2,400.00	Meter
Nashville, Tennessee	125,000	475 acres	140,000.00	Municipal	\$1,000.00	Flat rate
New Britain, Connecticut	60,000	410 acres	10,000.00	Municipal	No charge	.....
New Haven, Connecticut	378,000	490 acres	75,000.00	Private	No charge	.....
New Orleans, Louisiana	165,000	1,107 acres	87,000.00	Municipal	No charge	.....
Oakland, California	200,000	350 acres	210,000.00	Private	\$8,000.00	Meter
Oklahoma City, Oklahoma	100,000	2,000 acres	25,000.00	Municipal	No charge	Meter
Pasadena, California	46,450	238.57 acres	112,802.00	Municipal	\$2,452.71	Meter
Peoria, Illinois	85,000	452 acres	100,000.00	Private	\$1,210.50	Meter
Pittsburgh, Pennsylvania	650,000	1,320.63 acres	318,639.00	Municipal	No charge	.....
Portland, Maine	60,000	181.97 acres	70,410.00	Municipal	\$30.60	Flat rate
Portland, Oregon	300,000	1,350 acres	161,000.00	Municipal	No charge	.....
Pueblo, Colorado	60,000	282 acres	36,860.00	Municipal	No charge	.....
Quincy, Illinois	40,000	300 acres	19,800.00	Municipal	No charge	.....
Racine, Wisconsin	50,000	200 acres	35,000.00	Private	\$700.00	Meter
Rochester, New York	250,000	1,600 acres	175,000.00	Municipal	No charge	.....
Rockford, Illinois	57,000	264 acres	65,000.00	Municipal	\$468.16	.....
Saginaw, Michigan	75,000	219.9 acres	16,572.00	Municipal	No charge	.....
Salt Lake City, Utah	125,000	152 acres	101,681.00	Municipal	No charge	.....
San Antonio, Texas	135,000	650 acres	100,000.00	Private	\$1,000.00	.....
San Diego, California	85,000	1,884.83 acres	95,000.00	Municipal	No charge	.....
San Francisco, California	560,000	1,800 acres	378,000.00	Private	\$24,800.00	Both
Seattle, Washington	348,000	1,815 acres	242,572.00	Municipal	\$3,825.00	Flat rate
South Bend, Indiana	65,000	346 acres	.....	Municipal	\$955.30	Meter
Spokane, Washington	125,000	1,933 acres	80,277.00	Municipal	\$6,500.00	Meter
East St. Louis, Illinois	72,105	1,200.24 acres	60,000.00	Private	\$700.00	.....
St. Louis, Missouri	850,000	2,240 acres	475,000.00	Municipal	No charge	.....
St. Paul, Minnesota	287,140	1,676.88 acres	120,000.00	Municipal	\$1,00.00	Flat rate
Syracuse, New York	150,000	040 acres	200,000.00	Municipal	No charge	.....
Tacoma, Washington	108,000	1,130 acres	100,000.00	Municipal	\$3,166.00	Meter
Terre Haute, Indiana	73,000	84 acres	25,000.00	Private	No charge	.....
Toledo, Ohio	250,000	1,552 acres	380,000.00	Municipal	No charge	.....
Waterloo, Iowa	35,590	200 acres	15,000.00	Municipal	No charge	.....
Wichita, Kansas	70,000	300 acres	15,461.00	Private	\$433.97	Meter
Wilkes-Barre, Pennsylvania	75,000	250 acres	40,000.00	Private	\$125.00	Flat rate
Wilmington, Delaware	110,000	535.2 acres	47,000.00	Municipal	No charge	.....
Youngstown, Ohio	120,000	375 acres	20,000.00	Municipal	No charge	.....
CANADIAN CITIES						
Brantford, Ontario	27,000	105 acres	½ mill on as.	Municipal	Nothing	.....
Calgary, Alberta	70,000	577 acres	60,000.00	Municipal	\$1,800.00	Flat rate
Edmonton, Alberta	53,794	1,004 acres	10,675.00	Municipal	\$302.00	Both
Halifax, Nova Scotia	50,000	500 acres	8,000.00	Municipal	Nothing	.....
Hamilton, Ontario	100,000	300 acres	43,000.00	Municipal	\$752.04	Meter
London, Ontario	60,000	460 acres	20,000.00	Municipal	No charge	.....
Ottawa, Ontario	100,000	350 acres	100,000.00	Municipal	No charge	.....
Regina, Saskatchewan	40,000	257 acres	20,000.00	Municipal	\$250.00	Meter
St. John, New Brunswick	50,000	.....	4,000.00	Municipal	No charge	.....
Toronto, Ontario	460,526	1,861.94 acres	384,756.00	Municipal	\$2,271.00	Flat rate
Vancouver, British Columbia	100,000	1,415.1 acres	49,398.00	Municipal	No charge	.....
Winnipeg, Manitoba	212,889	763.33 acres	171,821.59	Municipal	\$669.40	Meter

Nashville, Tennessee	125,000	475	acres	140,000.00	Municipal	\$1,000.00	Flat rate
New Britain, Connecticut	60,000	410	acres	10,000.00	Municipal	No charge	.....
New Haven, Connecticut	378,000	490	acres	75,000.00	Private	No charge	.....
New Orleans, Louisiana	165,000	1,107	acres	87,000.00	Municipal	No charge	.....
Oakland, California	200,000	350	acres	210,000.00	Private	\$8,000.00	Meter
Oklahoma City, Oklahoma	100,000	2,000	acres	25,000.00	Municipal	No charge	Meter
Pasadena, California	46,450	238.57	acres	112,802.00	Municipal	\$2,452.71	Meter
Peoria, Illinois	85,000	452	acres	100,000.00	Private	\$1,210.50	Meter
Pittsburgh, Pennsylvania	650,000	1,320.63	acres	318,639.00	Municipal	No charge	.....
Portland, Maine	60,000	181.97	acres	70,410.00	Municipal	\$30.60	Flat rate
Portland, Oregon	300,000	1,350	acres	161,000.00	Municipal	No charge	.....
Pueblo, Colorado	60,000	282	acres	36,860.00	Municipal	No charge	.....
Quincy, Illinois	40,000	300	acres	19,800.00	Municipal	No charge	.....
Racine, Wisconsin	50,000	200	acres	35,000.00	Private	\$700.00	.....
Rochester, New York	250,000	1,600	acres	175,000.00	Municipal	No charge	.....
Rockford, Illinois	57,000	264	acres	65,000.00	Municipal	\$468.16	.....
Saginaw, Michigan	75,000	219.9	acres	16,572.00	Municipal	No charge	.....
Salt Lake City, Utah	125,000	152	acres	101,681.00	Municipal	No charge	.....
San Antonio, Texas	135,000	650	acres	100,000.00	Private	\$1,000.00	.....
San Diego, California	85,000	1,884.83	acres	95,000.00	Municipal	No charge	.....
San Francisco, California	560,000	1,800	acres	378,000.00	Private	\$24,800.00	Both
Seattle, Washington	348,000	1,815	acres	242,572.00	Municipal	\$3,825.00	Flat rate
South Bend, Indiana	65,000	346	acres	.....	Municipal	\$955.30	Meter
Spokane, Washington	125,000	1,933	acres	80,277.00	Municipal	\$6,500.00	Meter
East St. Louis, Illinois	72,105	1,200.24	acres	60,000.00	Private	\$700.00	.....
St. Louis, Missouri	850,000	2,240	acres	475,000.00	Municipal	No charge	.....
St. Paul, Minnesota	287,140	1,676.88	acres	120,000.00	Municipal	\$1,00.00	Flat rate
Syracuse, New York	150,000	040	acres	200,000.00	Municipal	No charge	.....
Tacoma, Washington	108,000	1,130	acres	100,000.00	Municipal	\$3,166.00	Meter
Terre Haute, Indiana	73,000	84	acres	25,000.00	Private	No charge	.....
Toledo, Ohio	250,000	1,552	acres	380,000.00	Municipal	No charge	.....
Waterloo, Iowa	35,590	200	acres	15,000.00	Municipal	No charge	.....
Wichita, Kansas	70,000	300	acres	15,461.00	Private	\$433.97	Meter
Wilkes-Barre, Pennsylvania	75,000	250	acres	40,000.00	Private	\$125.00	Flat rate
Wilmington, Delaware	110,000	535.2	acres	47,000.00	Municipal	No charge	.....
Youngstown, Ohio	120,000	375	acres	27,000.00	Municipal	No charge	.....
CANADIAN CITIES							
Brantford, Ontario	27,000	105	acres	1½ mill on as.	Municipal	Nothing	.....
Calgary, Alberta	70,000	577	acres	60,000.00	Municipal	\$1,800.00	Flat rate
Edmonton, Alberta	53,794	1,004	acres	10,675.00	Municipal	\$302.00	Both
Halifax, Nova Scotia	50,000	500	acres	8,000.00	Municipal	Nothing	.....
Hamilton, Ontario	100,000	300	acres	43,000.00	Municipal	\$752.04	Meter
London, Ontario	60,000	460	acres	20,000.00	Municipal	No charge	.....
Ottawa, Ontario	100,000	350	acres	100,000.00	Municipal	No charge	.....
Regina, Saskatchewan	40,000	257	acres	20,000.00	Municipal	\$250.00	Meter
St. John, New Brunswick	50,000	.....	.....	4,000.00	Municipal	No charge	.....
Toronto, Ontario	460,526	1,861.94	acres	384,756.00	Municipal	\$2,271.00	Flat rate
Vancouver, British Columbia	100,000	1,415.1	acres	49,398.00	Municipal	No charge	.....
Winnipeg, Manitoba	212,889	763.83	acres	171,821.59	Municipal	\$669.40	Meter

